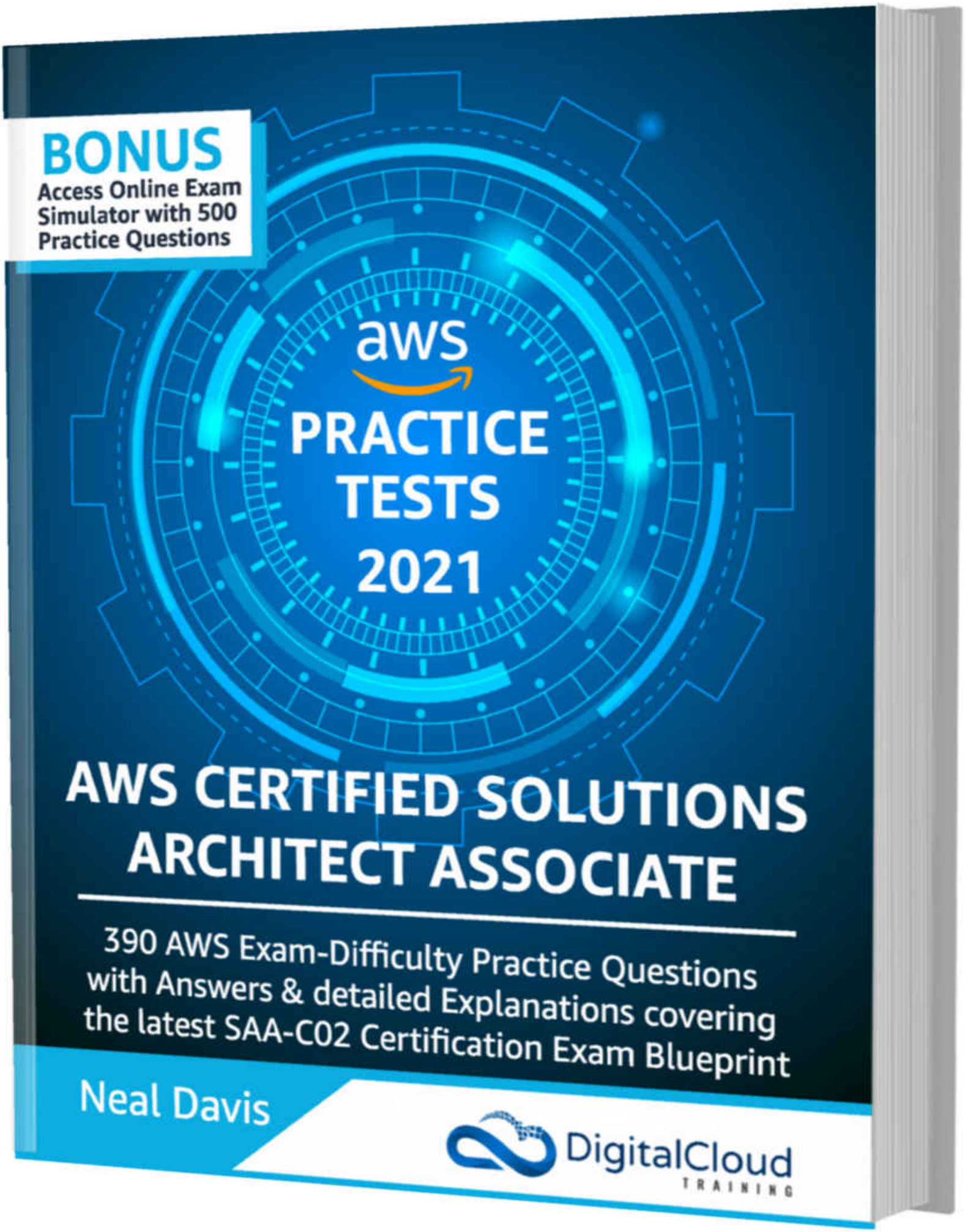
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GETTING STARTED

Welcome

Congratulations, you have just gained access to the highest quality practice tests for the AWS Solutions Architect Associate Certification Exam. These practice tests will prepare you thoroughly for the real exam so that you get to pass with flying colors.

There are **6 practice exams with 65 questions** each and each set of practice exams includes questions from the four domains of the latest **SAA-C02** exam. All **390 practice questions** were designed to reflect the difficulty of the real AWS exam. With these Practice Tests, you'll know when you are ready to pass your AWS Solutions Architect Associate exam first time! We recommend re-taking these practice tests until you consistently score 80% or higher - that's when you're ready to sit the exam and achieve a great score!

If you want easy to pass questions, then these Practice Tests are not for you! Our students love these high-quality practice tests because they **match the level of difficulty and exam pattern** of the actual certification exam and help them understand the AWS concepts. Students who have recently passed the SAA-C02 exam confirm that these AWS practice questions are the most similar to the real exam.

I hope you get great value from this resource that has been well received by our pool of over 250,000 students. Through diligent study of these questions, you will be in the perfect position to ace your AWS Certified Solutions Architect Associate exam first time.

Wishing you all the best with your AWS Certification exam.

Neal Davis

Founder of Digital Cloud Training

How to best use this Resource

We have organized the 390 practice questions into 6 sets and each set is repeated once without answers and explanations and once with answers and explanations. This allows you to choose from two methods of preparation.

1. Exam simulation

To simulate the exam experience, use the "PRACTICE QUESTIONS ONLY" sets. Grab a pen and paper to record your answers for all 65 questions. After completing each set, check your answers using the "PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS" section.

To calculate your total score, sum up the number of correct answers and multiply them by 1.54 (weighting out of 100%) to get your percentage score out of 100%. For example, if you got 50 questions right, the calculation would be 50 x 1.54 = 77%. The pass mark of the official AWS exam is 72%.

2. Training mode

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SET 1: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 1: Practice Questions, Answers & Explanations

1. Question

An application is being created that will use Amazon EC2 instances to generate and store data. Another set of EC2 instances will then analyze and modify the data. Storage requirements will be significant and will continue to grow over time. The application architects require a storage solution.

Which actions would meet these needs?

1: Store the data in an Amazon EBS volume. Mount the EBS volume on the application instances

2: Store the data in an Amazon EFS filesystem. Mount the file system on the application instances

3: Store the data in Amazon S3 Glacier. Update the vault policy to allow access to the application instances

4: Store the data in AWS Storage Gateway. Setup AWS Direct Connect between the Gateway appliance and the EC2 instances

2. Question

A company hosts a multiplayer game on AWS. The application uses Amazon EC2 instances in a single Availability Zone and users connect over Layer 4. Solutions Architect has been tasked with making the architecture highly available and also more cost-effective.

How can the solutions architect best meet these requirements? (Select TWO)

1: Configure an Auto Scaling group to add or remove instances in the Availability Zone automatically

2: Increase the number of instances and use smaller EC2 instance types

3: Configure a Network Load Balancer in front of the EC2 instances

4: Configure an Application Load Balancer in front of the EC2 instances

5: Configure an Auto Scaling group to add or remove instances in multiple Availability Zones automatically

3. Question

A company delivers content to subscribers distributed globally from an application running on AWS. The application uses a fleet of Amazon EC2 instance in a private subnet behind an Application Load Balancer (ALB). Due to an update in copyright restrictions, it is necessary to block access for specific countries.

What is the EASIEST method to meet this requirement?

1: Modify the ALB security group to deny incoming traffic from blocked countries

2: Modify the security group for EC2 instances to deny incoming traffic from blocked countries

3: Use Amazon CloudFront to serve the application and deny access to blocked countries

4: Use a network ACL to block the IP address ranges associated with the specific countries

4. Question

A company stores important data in an Amazon S3 bucket. A solutions architect needs to ensure that data can be recovered in case of accidental deletion.

Which action will accomplish this?

1: Enable Amazon S3 versioning

2: Enable Amazon S3 Intelligent-Tiering

3: Enable an Amazon S3 lifecycle policy

4: Enable Amazon S3 cross-Region replication

5. Question

A company is migrating from an on-premises infrastructure to the AWS Cloud. One of the company's applications stores files on a Windows file server farm that uses Distributed File System Replication (DFSR) to keep data in sync. A solutions architect needs to replace the file server farm.

Which service should the solutions architect use?

1: Amazon EFS

2: Amazon FSx

3: Amazon S3

4: AWS Storage Gateway

6. Question

A website runs on Amazon EC2 instances in an Auto Scaling group behind an Application Load Balancer (ALB) which serves as an origin for an Amazon CloudFront distribution. An AWS WAF is being used to protect against SQL injection attacks. A review of security logs revealed an external malicious IP that needs to be blocked from accessing the website.

What should a solutions architect do to protect the application?

1: Modify the network ACL on the CloudFront distribution to add a deny rule for the malicious IP address

2: Modify the configuration of AWS WAF to add an IP match condition to block the malicious IP address

3: Modify the network ACL for the EC2 instances in the target groups behind the ALB to deny the malicious IP address

4: Modify the security groups for the EC2 instances in the target groups behind the ALB to deny the malicious IP address

7. Question

An ecommerce website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The application is stateless and elastic and scales from a minimum of 10 instances, up to a maximum of 200 instances. For at least 80% of the time at least 40 instances are required.

Which solution should be used to minimize costs?

1: Purchase Reserved Instances to cover 200 instances

2: Purchase Reserved Instances to cover 80 instances. Use Spot Instances to cover the remaining instances

3: Purchase On-Demand Instances to cover 40 instances. Use Spot Instances to cover the remaining instances

4: Purchase Reserved Instances to cover 40 instances. Use On-Demand and Spot Instances to cover the remaining instances

8. Question

A solutions architect is creating a system that will run analytics on financial data for 4 hours a night, 5 days a week. The analysis is expected to run for the same duration and cannot be interrupted once it is started. The system will be required for a minimum of 1 year.

Which type of Amazon EC2 instances should be used to reduce the cost of the system?

1: Spot Instances

2: On-Demand Instances

3: Standard Reserved Instances

4: Scheduled Reserved Instances

9. Question

A solutions architect needs to backup some application log files from an online ecommerce store to Amazon S3. It is unknown how often the logs will be accessed or which logs will be accessed the most. The solutions architect must keep costs as low as possible by using the appropriate S3 storage class.

Which S3 storage class should be implemented to meet these requirements?

1: S3 Glacier

2: S3 Intelligent-Tiering

3: S3 Standard-Infrequent Access (S3 Standard-IA)

4: S3 One Zone-Infrequent Access (S3 One Zone-IA)

10. Question

A solutions architect is designing a new service that will use an Amazon API Gateway API on the frontend. The service will need to persist data in a backend database using key-value requests. Initially, the data requirements will be around 1 GB and future growth is unknown. Requests can range from 0 to over 800 requests per second.

Which combination of AWS services would meet these requirements? (Select TWO)

1: AWS Fargate

2: AWS Lambda

3: Amazon DynamoDB

4: Amazon EC2 Auto Scaling

5: Amazon RDS

11. Question

A company's application is running on Amazon EC2 instances in a single Region. In the event of a disaster, a solutions architect needs to ensure that the resources can also be deployed to a second Region.

Which combination of actions should the solutions architect take to accomplish this? (Select TWO)

1: Detach a volume on an EC2 instance and copy it to an Amazon S3 bucket in the second Region

2: Launch a new EC2 instance from an Amazon Machine Image (AMI) in the second Region

3: Launch a new EC2 instance in the second Region and copy a volume from Amazon S3 to the new instance

4: Copy an Amazon Machine Image (AMI) of an EC2 instance and specify the second Region for the destination

5: Copy an Amazon Elastic Block Store (Amazon EBS) volume from Amazon S3 and launch an EC2 instance in the second Region using that EBS volume

12. Question

A solutions architect is creating a document submission application for a school. The application will use an Amazon S3 bucket for storage. The solution must prevent accidental deletion of the documents and ensure that all versions of the documents are available. Users must be able to upload and modify the documents.

Which combination of actions should be taken to meet these requirements? (Select TWO)

1: Set read-only permissions on the bucket

2: Enable versioning on the bucket
3: Attach an IAM policy to the bucket
4: Enable MFA Delete on the bucket
5: Encrypt the bucket using AWS SSE-S3

13. Question

A solutions architect is designing an application on AWS. The compute layer will run in parallel across EC2 instances. The compute layer should scale based on the number of jobs to be processed. The compute layer is stateless. The solutions architect must ensure that the application is loosely coupled and the job items are durably stored.
Which design should the solutions architect use?

1: Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on CPU usage

2: Create an Amazon SQS queue to hold the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on network usage

3: Create an Amazon SQS queue to hold the jobs that needs to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of items in the SQS queue

4: Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of messages published to the SNS topic

14. Question

A team are planning to run analytics jobs on log files each day and require a storage solution. The size and number of logs is unknown and data will persist for 24 hours only.
What is the MOST cost-effective solution?

1: Amazon S3 Glacier Deep Archive

2: Amazon S3 Standard
3: Amazon S3 Intelligent-Tiering
4: Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)

15. Question

A company runs a web application that serves weather updates. The application runs on a fleet of Amazon EC2 instances in a Multi-AZ Auto scaling group behind an Application Load Balancer (ALB). The instances store data in an Amazon Aurora database. A solutions architect needs to make the application more resilient to sporadic increases in request rates.

Which architecture should the solutions architect implement? (Select TWO)

1: Add and AWS WAF in front of the ALB
2: Add Amazon Aurora Replicas
3: Add an AWS Transit Gateway to the Availability Zones
4: Add an AWS Global Accelerator endpoint
5: Add an Amazon CloudFront distribution in front of the ALB

16. Question

An Amazon VPC contains several Amazon EC2 instances. The instances need to make API calls to Amazon DynamoDB. A solutions architect needs to ensure that the API calls do not traverse the internet.

How can this be accomplished? (Select TWO)

1: Create a route table entry for the endpoint
2: Create a gateway endpoint for DynamoDB
3: Create a new DynamoDB table that uses the endpoint
4: Create an ENI for the endpoint in each of the subnets of the VPC
5: Create a VPC peering connection between the VPC and DynamoDB

17. Question

A solutions architect is designing the infrastructure to run an application on Amazon EC2 instances. The application requires high

availability and must dynamically scale based on demand to be cost efficient.

What should the solutions architect do to meet these requirements?

1: Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Regions

2: Configure an Amazon CloudFront distribution in front of an Auto Scaling group to deploy instances to multiple Regions

3: Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Availability Zones

4: Configure an Amazon API Gateway API in front of an Auto Scaling group to deploy instances to multiple Availability Zones

18. Question

A retail company with many stores and warehouses is implementing IoT sensors to gather monitoring data from devices in each location. The data will be sent to AWS in real time. A solutions architect must provide a solution for ensuring events are received in order for each device and ensure that data is saved for future processing.

Which solution would be MOST efficient?

1: Use Amazon Kinesis Data Streams for real-time events with a partition key for each device. Use Amazon Kinesis Data Firehose to save data to Amazon S3

2: Use Amazon Kinesis Data Streams for real-time events with a shard for each device. Use Amazon Kinesis Data Firehose to save data to Amazon EBS

3: Use an Amazon SQS FIFO queue for real-time events with one queue for each device. Trigger an AWS Lambda function for the SQS queue to save data to Amazon EFS

4: Use an Amazon SQS standard queue for real-time events with one queue for each device. Trigger an AWS Lambda function from the SQS queue to save data to Amazon S3

19. Question

An organization want to share regular updates about their charitable work using static webpages. The pages are expected to generate a large

amount of views from around the world. The files are stored in an Amazon S3 bucket. A solutions architect has been asked to design an efficient and effective solution.

Which action should the solutions architect take to accomplish this?

1: Generate presigned URLs for the files

2: Use cross-Region replication to all Regions

3: Use the geoproximity feature of Amazon Route 53

4: Use Amazon CloudFront with the S3 bucket as its origin

20. Question

An insurance company has a web application that serves users in the United Kingdom and Australia. The application includes a database tier using a MySQL database hosted in eu-west-2. The web tier runs from eu-west-2 and ap-southeast-2. Amazon Route 53 geoproximity routing is used to direct users to the closest web tier. It has been noted that Australian users receive slow response times to queries.

Which changes should be made to the database tier to improve performance?

1: Migrate the database to Amazon RDS for MySQL. Configure Multi-AZ in the Australian Region

2: Migrate the database to Amazon DynamoDB. Use DynamoDB global tables to enable replication to additional Regions

3: Deploy MySQL instances in each Region. Deploy an Application Load Balancer in front of MySQL to reduce the load on the primary instance

4: Migrate the database to an Amazon Aurora global database in MySQL compatibility mode. Configure read replicas in ap-southeast-2

21. Question

A web application runs in public and private subnets. The application architecture consists of a web tier and database tier running on Amazon EC2 instances. Both tiers run in a single Availability Zone (AZ).

Which combination of steps should a solutions architect take to provide high availability for this architecture? (Select TWO)

1: Create new public and private subnets in the same AZ for high availability

2: Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs

3: Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)

4: Create new public and private subnets in a new AZ. Create a database using Amazon EC2 in one AZ

5: Create new public and private subnets in the same VPC, each in a new AZ. Migrate the database to an Amazon RDS multi-AZ deployment

22. Question

An application running on an Amazon ECS container instance using the EC2 launch type needs permissions to write data to Amazon DynamoDB.

How can you assign these permissions only to the specific ECS task that is running the application?

1: Create an IAM policy with permissions to DynamoDB and attach it to the container instance

2: Create an IAM policy with permissions to DynamoDB and assign It to a task using the *taskRoleArn* parameter

3: Use a security group to allow outbound connections to DynamoDB and assign it to the container instance

4: Modify the *AmazonECSTaskExecutionRolePolicy* policy to add permissions for DynamoDB

23. Question

An organization has a large amount of data on Windows (SMB) file shares in their on-premises data center. The organization would like to move data into Amazon S3. They would like to automate the migration of data over their AWS Direct Connect link.

Which AWS service can assist them?

1: AWS Database Migration Service (DMS)

2: AWS CloudFormation

3: AWS Snowball

4: AWS DataSync

24. Question

The database tier of a web application is running on a Windows server on-premises. The database is a Microsoft SQL Server database. The application owner would like to migrate the database to an Amazon RDS instance.

How can the migration be executed with minimal administrative effort and downtime?

1: Use the AWS Server Migration Service (SMS) to migrate the server to Amazon EC2.Use AWS Database Migration Service (DMS) to migrate the database to RDS

2: Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS

3: Use AWS DataSync to migrate the data from the database to Amazon S3. Use AWS Database Migration Service (DMS) to migrate the database to RDS

4: Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS. Use the Schema Conversion Tool (SCT) to enable conversion from Microsoft SQL Server to Amazon RDS

25. Question

A new application will run across multiple Amazon ECS tasks. Front-end application logic will process data and then pass that data to a back-end ECS task to perform further processing and write the data to a datastore. The Architect would like to reduce-interdependencies so failures do no impact other components.

Which solution should the Architect use?

1: Create an Amazon Kinesis Firehose delivery stream and configure the front-end to add data to the stream and the back-end to read data from the stream

2: Create an Amazon Kinesis Firehose delivery stream that delivers data to an Amazon S3 bucket, configure the front-end to write data to the stream and the back-end to read data from Amazon S3

3: Create an Amazon SQS queue that pushes messages to the back-end. Configure the front-end to add messages to the queue

4: Create an Amazon SQS queue and configure the front-end to add messages to the queue and the back-end to poll the queue for messages

26. Question

An application receives images uploaded by customers and stores them on Amazon S3. An AWS Lambda function then processes the images to add graphical elements. The processed images need to be available for users to download for 30 days, after which time they can be deleted. Processed images can be easily recreated from original images. The Original images need to be immediately available for 30 days and be accessible within 24 hours for another 90 days.

Which combination of Amazon S3 storage classes is most cost-effective for the original and processed images? (Select TWO)

1: Store the original images in STANDARD for 30 days, transition to GLACIER for 90 days, then expire the data

2: Store the original images in STANDARD_IA for 30 days and then transition to DEEP_ARCHIVE

3: Store the processed images in ONEZONE_IA and then expire the data after 30 days

4: Store the processed images in STANDARD and then transition to GLACIER after 30 days

5: Store the original images in STANDARD for 30 days, transition to DEEP_ARCHIVE for 90 days, then expire the data

27. Question

Amazon EC2 instances in a development environment run between 9am and 5pm Monday-Friday. Production instances run 24/7. Which pricing models should be used? (Select TWO)

1: Use Spot instances for the development environment

2: Use Reserved instances for the development environment

3: Use scheduled reserved instances for the development environment

4: Use Reserved instances for the production environment

5: Use On-Demand instances for the production environment

28. Question

An application running on Amazon EC2 needs to asynchronously invoke an AWS Lambda function to perform data processing. The services should be decoupled.

Which service can be used to decouple the compute services?

1: Amazon SQS
2: Amazon SNS
3: Amazon MQ
4: AWS Step Functions

29. Question

A manual script that runs a few times a week and completes within 10 minutes needs to be replaced with an automated solution. Which of the following options should an Architect use?

1: Use a cron job on an Amazon EC2 instance
2: Use AWS Batch
3: Use AWS Lambda
4: Use AWS CloudFormation

30. Question

A company wishes to restrict access to their Amazon DynamoDB table to specific, private source IP addresses from their VPC. What should be done to secure access to the table?

1: Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)
2: Create a gateway VPC endpoint and add an entry to the route table
3: Create the Amazon DynamoDB table in the VPC
4: Create an AWS VPN connection to the Amazon DynamoDB endpoint

31. Question

An AWS Organization has an OU with multiple member accounts in it. The company needs to restrict the ability to launch only specific

Amazon EC2 instance types. How can this policy be applied across the accounts with the least effort?

1: Create an SCP with an allow rule that allows launching the specific instance types

2: Create an SCP with a deny rule that denies all but the specific instance types

3: Create an IAM policy to deny launching all but the specific instance types

4: Use AWS Resource Access Manager to control which launch types can be used

32. Question

A new relational database is being deployed on AWS. The performance requirements are unknown. Which database service does not require you to make capacity decisions upfront?

1: Amazon DynamoDB

2: Amazon Aurora Serverless

3: Amazon ElastiCache

4: Amazon RDS

33. Question

An Amazon RDS Read Replica is being deployed in a separate region. The master database is not encrypted but all data in the new region must be encrypted. How can this be achieved?

1: Enable encryption using Key Management Service (KMS) when creating the cross-region Read Replica

2: Encrypt a snapshot from the master DB instance, create an encrypted cross-region Read Replica from the snapshot

3: Enabled encryption on the master DB instance, then create an encrypted cross-region Read Replica

4: Encrypt a snapshot from the master DB instance, create a new encrypted master DB instance, and then create an encrypted cross-region Read Replica

34. Question

A legacy tightly-coupled High Performance Computing (HPC) application will be migrated to AWS. Which network adapter type should be used?

1: Elastic Network Interface (ENI)

2: Elastic Network Adapter (ENA)

3: Elastic Fabric Adapter (EFA)

4: Elastic IP Address

35. Question

A new application is to be published in multiple regions around the world. The Architect needs to ensure only 2 IP addresses need to be whitelisted. The solution should intelligently route traffic for lowest latency and provide fast regional failover.

How can this be achieved?

1: Launch EC2 instances into multiple regions behind an NLB with a static IP address

2: Launch EC2 instances into multiple regions behind an ALB and use a Route 53 failover routing policy

3: Launch EC2 instances into multiple regions behind an NLB and use AWS Global Accelerator

4: Launch EC2 instances into multiple regions behind an ALB and use Amazon CloudFront with a pair of static IP addresses

36. Question

A company is deploying a big data and analytics workload. The analytics will be run from a fleet of thousands of EC2 instances across multiple AZs. Data needs to be stored on a shared storage layer that can be mounted and accessed concurrently by all EC2 instances. Latency is not a concern however extremely high throughput is required.

What storage layer would be most suitable for this requirement?

1: Amazon EFS in General Purpose mode

2: Amazon EFS in Max I/O mode

3: Amazon EBS PIOPS

4: Amazon S3

37. Question

A Solutions Architect is designing a highly-scalable system to track records. Records must remain available for immediate download for three months, and then the records must be deleted.

What's the most appropriate decision for this use case?

1: Store the files on Amazon EBS, and create a lifecycle policy to remove the files after three months

2: Store the files on Amazon Glacier, and create a lifecycle policy to remove the files after three months

3: Store the files on Amazon S3, and create a lifecycle policy to remove the files after three months

4: Store the files on Amazon EFS, and create a lifecycle policy to remove the files after three months

38. Question

You are a Solutions Architect at Digital Cloud Training. A large multi-national client has requested a design for a multi-region, multi-master database. The client has requested that the database be designed for fast, massively scaled applications for a global user base. The database should be a fully managed service including the replication.

Which AWS service can deliver these requirements?

1: DynamoDB with Global Tables and Multi-Region Replication

2: EC2 instances with EBS replication

3: S3 with Cross Region Replication

4: RDS with Multi-AZ

39. Question

Your company is starting to use AWS to host new web-based applications. A new two-tier application will be deployed that provides customers with access to data records. It is important that the application is highly responsive and retrieval times are optimized. You're looking for a persistent data store that can provide the required performance. From the list below what AWS service would you recommend for this requirement?

1: RDS in a multi-AZ configuration
2: ElastiCache with the Redis engine
3: Kinesis Data Streams
4: ElastiCache with the Memcached engine

40. Question

A Linux instance running in your VPC requires some configuration changes to be implemented locally and you need to run some commands. Which of the following can be used to securely access the instance?

1: SSL/TLS certificate
2: Public key
3: Key Pairs
4: EC2 password

41. Question

A manufacturing company captures data from machines running at customer sites. Currently, thousands of machines send data every 5 minutes, and this is expected to grow to hundreds of thousands of machines in the near future. The data is logged with the intent to be analyzed in the future as needed.

What is the SIMPLEST method to store this streaming data at scale?

1: Create an Amazon EC2 instance farm behind an ELB to store the data in Amazon EBS Cold HDD volumes
2: Create an Amazon SQS queue, and have the machines write to the queue
3: Create an Amazon Kinesis Firehose delivery stream to store the data in Amazon S3
4: Create an Auto Scaling Group of Amazon EC2 instances behind ELBs to write data into Amazon RDS

42. Question

There is a temporary need to share some video files that are stored in a private S3 bucket. The consumers do not have AWS accounts and you need to ensure that only authorized consumers can access the files. What is the best way to enable this access?

1: Enable public read access for the S3 bucket

2: Use CloudFront to distribute the files using authorization hash tags

3: Generate a pre-signed URL and distribute it to the consumers

4: Configure an allow rule in the Security Group for the IP addresses of the consumers

43. Question

A Solutions Architect needs to improve performance for a web application running on EC2 instances launched by an Auto Scaling group. The instances run behind an ELB Application Load Balancer. During heavy use periods the ASG doubles in size and analysis has shown that static content stored on the EC2 instances is being requested by users in a specific geographic location.

How can the Solutions Architect reduce the need to scale and improve the application performance?

1: Store the contents on Amazon EFS instead of the EC2 root volume

2: Implement Amazon Redshift to create a repository of the content closer to the users

3: Create an Amazon CloudFront distribution for the site and redirect user traffic to the distribution

4: Re-deploy the application in a new VPC that is closer to the users making the requests

44. Question

A company needs to store data for 5 years. The company will need to have immediate and highly available access to the data at any point in time but will not require frequent access.

Which lifecycle action should be taken to meet the requirements while reducing costs?

1: Transition objects from Amazon S3 Standard to the GLACIER storage class

2: Transition objects to expire after 5 years

3: Transition objects from Amazon S3 Standard to Amazon S3 Standard-Infrequent Access (S3 Standard-IA)

4: Transition objects from Amazon S3 Standard to Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)

45. Question

A retail organization is deploying a new application that will read and write data to a database. The company wants to deploy the application in three different AWS Regions in an active-active configuration. The databases need to replicate to keep information in sync.

Which solution best meets these requirements?

1: AWS Database Migration Service with change data capture

2: Amazon DynamoDB with global tables

3: Amazon Athena with Amazon S3 cross-region replication

4: Amazon Aurora Global Database

46. Question

You are a Solutions Architect at Digital Cloud Training. One of your clients runs an application that writes data to a DynamoDB table. The client has asked how they can implement a function that runs code in response to item level changes that take place in the DynamoDB table. What would you suggest to the client?

1: Enable server access logging and create an event source mapping between AWS Lambda and the S3 bucket to which the logs are written

2: Enable DynamoDB Streams and create an event source mapping between AWS Lambda and the relevant stream

3: Create a local secondary index that records item level changes and write some custom code that responds to updates to the index

4: Use Kinesis Data Streams and configure DynamoDB as a producer

47. Question

A recent security audit uncovered some poor deployment and configuration practices within your VPC. You need to ensure that applications are deployed in secure configurations.

How can this be achieved in the most operationally efficient manner?

1: Remove the ability for staff to deploy applications

2: Use CloudFormation with securely configured templates

3: Manually check all application configurations before deployment

4: Use AWS Inspector to apply secure configurations

48. Question

A Solutions Architect needs to transform data that is being uploaded into S3. The uploads happen sporadically and the transformation should be triggered by an event. The transformed data should then be loaded into a target data store.

What services would be used to deliver this solution in the MOST cost-effective manner? (Select TWO)

1: Configure a CloudWatch alarm to send a notification to CloudFormation when data is uploaded

2: Configure S3 event notifications to trigger a Lambda function when data is uploaded and use the Lambda function to trigger the ETL job

3: Configure CloudFormation to provision a Kinesis data stream to transform the data and load it into S3

4: Use AWS Glue to extract, transform and load the data into the target data store

5: Configure CloudFormation to provision AWS Data Pipeline to transform the data

49. Question

An application you manage uses Auto Scaling and a fleet of EC2 instances. You recently noticed that Auto Scaling is scaling the number of instances up and down multiple times in the same hour. You need to implement a remediation to reduce the amount of scaling events. The remediation must be cost-effective and preserve elasticity. What design changes would you implement? (Select TWO)

1: Modify the CloudWatch alarm period that triggers your Auto Scaling scale down policy

2: Modify the Auto Scaling group termination policy to terminate the newest instance first

3: Modify the Auto Scaling group termination policy to terminate the oldest instance first

4: Modify the Auto Scaling group cool-down timers

5: Modify the Auto Scaling policy to use scheduled scaling actions

50. Question

An application runs on two EC2 instances in private subnets split between two AZs. The application needs to connect to a CRM SaaS application running on the Internet. The vendor of the SaaS application restricts authentication to a whitelist of source IP addresses and only 2 IP addresses can be configured per customer.

What is the most appropriate and cost-effective solution to enable authentication to the SaaS application?

1: Use a Network Load Balancer and configure a static IP for each AZ

2: Use multiple Internet-facing Application Load Balancers with Elastic IP addresses

3: Configure redundant Internet Gateways and update the routing tables for each subnet

4: Configure a NAT Gateway for each AZ with an Elastic IP address

51. Question

An application tier of a multi-tier web application currently hosts two web services on the same set of instances. The web services each listen for traffic on different ports. Which AWS service should a Solutions Architect use to route traffic to the service based on the incoming request path?

1: Amazon Route 53

2: Amazon CloudFront

3: Application Load Balancer (ALB)

4: Classic Load Balancer (CLB)

52. Question

The data scientists in your company are looking for a service that can process and analyze real-time, streaming data. They would like to use standard SQL queries to query the streaming data.

Which combination of AWS services would deliver these requirements?

1: DynamoDB and EMR

2: Kinesis Data Streams and Kinesis Data Analytics

3: ElastiCache and EMR
4: Kinesis Data Streams and Kinesis Firehose

53. Question

An e-commerce application is hosted in AWS. The last time a new product was launched, the application experienced a performance issue due to an enormous spike in traffic. Management decided that capacity must be doubled this week after the product is launched.
What is the MOST efficient way for management to ensure that capacity requirements are met?

1: Add a Step Scaling policy
2: Add a Simple Scaling policy
3: Add a Scheduled Scaling action
4: Add Amazon EC2 Spot instances

54. Question

You need to configure an application to retain information about each user session and have decided to implement a layer within the application architecture to store this information.
Which of the options below could be used? (Select TWO)

1: Sticky sessions on an Elastic Load Balancer (ELB)
2: A block storage service such as Elastic Block Store (EBS)
3: A workflow service such as Amazon Simple Workflow Service (SWF)
4: A relational data store such as Amazon RDS
5: A key/value store such as ElastiCache Redis

55. Question

An application running on an external website is attempting to initiate a request to your company's website using API calls to Amazon API Gateway. A problem has been reported in which the requests are failing with an error that includes the following text:
"Cross-Origin Request Blocked: The Same Origin Policy disallows reading the remote resource"

You have been asked to resolve the problem, what is the most likely solution?

1: The IAM policy does not allow access to the API

2: The ACL on the API needs to be updated

3: The request is not secured with SSL/TLS

4: Enable CORS on the APIs resources using the selected methods under the API Gateway

56. Question

A solutions Architect is designing a new workload where an AWS Lambda function will access an Amazon DynamoDB table.

What is the MOST secure means of granting the Lambda function access to the DynamoDB table?

1: Create an identity and access management (IAM) role with the necessary permissions to access the DynamoDB table, and assign the role to the Lambda function

2: Create a DynamoDB username and password and give them to the Developer to use in the Lambda function

3: Create an identity and access management (IAM) user and create access and secret keys for the user. Give the user the necessary permissions to access the DynamoDB table. Have the Developer use these keys to access the resources

4: Create an identity and access management (IAM) role allowing access from AWS Lambda and assign the role to the DynamoDB table

57. Question

You are a Solutions Architect at a media company and you need to build an application stack that can receive customer comments from sporting events. The application is expected to receive significant load that could scale to millions of messages within a short space of time following high-profile matches. As you are unsure of the load required for the database layer what is the most cost-effective way to ensure that the messages are not dropped?

1: Use DynamoDB and provision enough write capacity to handle the highest expected load

2: Write the data to an S3 bucket, configure RDS to poll the bucket for new messages

3: Create an SQS queue and modify the application to write to the SQS queue. Launch another application instance the polls the queue and writes messages to the database

4: Use RDS Auto Scaling for the database layer which will automatically scale as required

58. Question

An organization in the health industry needs to create an application that will transmit protected health data to thousands of service consumers in different AWS accounts. The application servers run on EC2 instances in private VPC subnets. The routing for the application must be fault tolerant.

What should be done to meet these requirements?

1: Create a virtual private gateway connection between each pair of service provider VPCs and service consumer VPCs

2: Create a proxy server in the service provider VPC to route requests from service consumers to the application servers

3: Create a VPC endpoint service and grant permissions to specific service consumers to create a connection

4: Create an internal Application Load Balancer in the service provider VPC and put application servers behind it

59. Question

A Solutions Architect is developing an encryption solution. The solution requires that data keys are encrypted using envelope protection before they are written to disk.

Which solution option can assist with this requirement?

1: API Gateway with STS

2: IAM Access Key

3: AWS Certificate Manager

4: AWS KMS API

60. Question

A research company is developing a data lake solution in Amazon S3 to analyze huge datasets. The solution makes infrequent SQL queries only. In addition, the company wants to minimize infrastructure costs.

Which AWS service should be used to meet these requirements?

1: Amazon Aurora

2: Amazon RDS for MySQL

3: Amazon Athena

4: Amazon Redshift Spectrum

61. Question

Your company shares some HR videos stored in an Amazon S3 bucket via CloudFront. You need to restrict access to the private content so users coming from specific IP addresses can access the videos and ensure direct access via the Amazon S3 bucket is not possible.

How can this be achieved?

1: Configure CloudFront to require users to access the files using signed cookies, create an origin access identity (OAI) and instruct users to login with the OAI

2: Configure CloudFront to require users to access the files using a signed URL, create an origin access identity (OAI) and restrict access to the files in the Amazon S3 bucket to the OAI

3: Configure CloudFront to require users to access the files using signed cookies, and move the files to an encrypted EBS volume

4: Configure CloudFront to require users to access the files using a signed URL, and configure the S3 bucket as a website endpoint

62. Question

The company you work for is currently transitioning their infrastructure and applications into the AWS cloud. You are planning to deploy an Elastic Load Balancer (ELB) that distributes traffic for a web application running on EC2 instances. You still have some application servers running on-premise and you would like to distribute application traffic across both your AWS and on-premises resources.

How can this be achieved?

1: Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use IP based targets for both your EC2 instances and on-premises servers

2: Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use Instance ID based targets for both your EC2 instances and on-premises servers

3: Provision an IPSec VPN connection between your on-premises location and AWS and create a CLB that uses cross-zone load balancing to distributed traffic across EC2 instances and on-premises servers

4: This cannot be done, ELBs are an AWS service and can only distribute traffic within the AWS cloud

63. Question

An application you are designing receives and processes files. The files are typically around 4GB in size and the application extracts metadata from the files which typically takes a few seconds for each file. The pattern of updates is highly dynamic with times of little activity and then multiple uploads within a short period of time.

What architecture will address this workload the most cost efficiently?

1: Use a Kinesis data stream to store the file, and use Lambda for processing

2: Store the file in an EBS volume which can then be accessed by another EC2 instance for processing

3: Upload files into an S3 bucket, and use the Amazon S3 event notification to invoke a Lambda function to extract the metadata

4: Place the files in an SQS queue, and use a fleet of EC2 instances to extract the metadata

64. Question

The website for a new application received around 50,000 requests each second and the company wants to use multiple applications to analyze the navigation patterns of the users on their website so they can personalize the user experience.

What can a Solutions Architect use to collect page clicks for the website and process them sequentially for each user?

1: Amazon Kinesis Data Streams
2: Amazon SQS FIFO queue
3: AWS CloudTrail trail
4: Amazon SQS standard queue

65. Question

You are building an application that will collect information about user behavior. The application will rapidly ingest large amounts of dynamic data and requires very low latency. The database must be scalable without incurring downtime. Which database would you recommend for this scenario?

1: RDS with MySQL
2: DynamoDB
3: RedShift
4: RDS with Microsoft SQL

SET 1: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

An application is being created that will use Amazon EC2 instances to generate and store data. Another set of EC2 instances will then analyze and modify the data. Storage requirements will be significant and will continue to grow over time. The application architects require a storage solution.

Which actions would meet these needs?

1: Store the data in an Amazon EBS volume. Mount the EBS volume on the application instances

2: Store the data in an Amazon EFS filesystem. Mount the file system on the application instances

3: Store the data in Amazon S3 Glacier. Update the vault policy to allow access to the application instances

4: Store the data in AWS Storage Gateway. Setup AWS Direct Connect between the Gateway appliance and the EC2 instances

Answer: 2

Explanation:

Amazon Elastic File System (Amazon EFS) provides a simple, scalable, fully managed elastic NFS file system for use with AWS Cloud services and on-premises resources. It is built to scale on demand to petabytes without disrupting applications, growing and shrinking automatically as you add and remove files, eliminating the need to provision and manage capacity to accommodate growth.

Amazon EFS supports the Network File System version 4 (NFSv4.1 and NFSv4.0) protocol. Multiple Amazon EC2 instances can access an Amazon EFS file system at the same time, providing a common data source for workloads and applications running on more than one instance or server.

For this scenario, EFS is a great choice as it will provide a scalable file system that can be mounted by multiple EC2 instances and accessed simultaneously.

CORRECT: "Store the data in an Amazon EFS filesystem. Mount the file system on the application instances" is the correct answer.

INCORRECT: "Store the data in an Amazon EBS volume. Mount the EBS volume on the application instances" is incorrect. Though there is a new feature that allows (EBS multi-attach) that allows attaching multiple Nitro instances to a volume, this is not on the exam yet, and has some specific constraints.

INCORRECT: "Store the data in Amazon S3 Glacier. Update the vault policy to allow access to the application instances" is incorrect as S3 Glacier is not a suitable storage location for live access to data, it is used for archival.

INCORRECT: "Store the data in AWS Storage Gateway. Setup AWS Direct Connect between the Gateway appliance and the EC2 instances" is incorrect. There is no reason to store the data on-premises in a Storage Gateway, using EFS is a much better solution.

2. Question

A company hosts a multiplayer game on AWS. The application uses Amazon EC2 instances in a single Availability Zone and users connect over Layer 4. Solutions Architect has been tasked with making the architecture highly available and also more cost-effective.

How can the solutions architect best meet these requirements? (Select TWO)

1: Configure an Auto Scaling group to add or remove instances in the Availability Zone automatically

2: Increase the number of instances and use smaller EC2 instance types

3: Configure a Network Load Balancer in front of the EC2 instances

4: Configure an Application Load Balancer in front of the EC2 instances

5: Configure an Auto Scaling group to add or remove instances in multiple Availability Zones automatically

Answer: 3, 5

Explanation:

The solutions architect must enable high availability for the architecture and ensure it is cost-effective. To enable high availability an Amazon EC2 Auto

Scaling group should be created to add and remove instances across multiple availability zones.

In order to distribute the traffic to the instances the architecture should use a Network Load Balancer which operates at Layer 4. This architecture will also be cost-effective as the Auto Scaling group will ensure the right number of instances are running based on demand.

CORRECT: "Configure a Network Load Balancer in front of the EC2 instances" is a correct answer.

CORRECT: "Configure an Auto Scaling group to add or remove instances in multiple Availability Zones automatically" is also a correct answer.

INCORRECT: "Increase the number of instances and use smaller EC2 instance types" is incorrect as this is not the most cost-effective option. Auto Scaling should be used to maintain the right number of active instances.

INCORRECT: "Configure an Auto Scaling group to add or remove instances in the Availability Zone automatically" is incorrect as this is not highly available as it's a single AZ.

INCORRECT: "Configure an Application Load Balancer in front of the EC2 instances" is incorrect as an ALB operates at Layer 7 rather than Layer 4.

3. Question

A company delivers content to subscribers distributed globally from an application running on AWS. The application uses a fleet of Amazon EC2 instance in a private subnet behind an Application Load Balancer (ALB). Due to an update in copyright restrictions, it is necessary to block access for specific countries.

What is the EASIEST method to meet this requirement?

1: Modify the ALB security group to deny incoming traffic from blocked countries

2: Modify the security group for EC2 instances to deny incoming traffic from blocked countries

3: Use Amazon CloudFront to serve the application and deny access to blocked countries

4: Use a network ACL to block the IP address ranges associated with the specific countries

Answer: 3

Explanation:

When a user requests your content, CloudFront typically serves the requested content regardless of where the user is located. If you need to prevent users in specific countries from accessing your content, you can use the CloudFront geo restriction feature to do one of the following:

- Allow your users to access your content only if they're in one of the countries on a whitelist of approved countries.
- Prevent your users from accessing your content if they're in one of the countries on a blacklist of banned countries.

For example, if a request comes from a country where, for copyright reasons, you are not authorized to distribute your content, you can use CloudFront geo restriction to block the request.

This is the easiest and most effective way to implement a geographic restriction for the delivery of content.

CORRECT: "Use Amazon CloudFront to serve the application and deny access to blocked countries" is the correct answer.

INCORRECT: "Use a Network ACL to block the IP address ranges associated with the specific countries" is incorrect as this would be extremely difficult to manage.

INCORRECT: "Modify the ALB security group to deny incoming traffic from blocked countries" is incorrect as security groups cannot block traffic by country.

INCORRECT: "Modify the security group for EC2 instances to deny incoming traffic from blocked countries" is incorrect as security groups cannot block traffic by country.

4. Question

A company stores important data in an Amazon S3 bucket. A solutions architect needs to ensure that data can be recovered in case of accidental deletion.

Which action will accomplish this?

1: Enable Amazon S3 versioning

2: Enable Amazon S3 Intelligent-Tiering

3: Enable an Amazon S3 lifecycle policy

4: Enable Amazon S3 cross-Region replication

Answer: 1

Explanation:

Object versioning is a means of keeping multiple variants of an object in the same Amazon S3 bucket. Versioning provides the ability to recover from both unintended user actions and application failures. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket.

CORRECT: "Enable Amazon S3 versioning" is the correct answer.

INCORRECT: "Enable Amazon S3 Intelligent-Tiering" is incorrect. This is a storage class that automatically moves data between frequent access and infrequent access classes based on usage patterns.

INCORRECT: "Enable an Amazon S3 lifecycle policy" is incorrect. An S3 lifecycle policy is a set of rules that define actions that apply to groups of S3 objects such as transitioning objects to another storage class.

INCORRECT: "Enable Amazon S3 cross-Region replication" is incorrect as this is used to copy objects to different regions. CRR relies on versioning which is the feature that is required for protecting against accidental deletion.

5. Question

A company is migrating from an on-premises infrastructure to the AWS Cloud. One of the company's applications stores files on a Windows file server farm that uses Distributed File System Replication (DFSR) to keep data in sync. A solutions architect needs to replace the file server farm.

Which service should the solutions architect use?

1: Amazon EFS

2: Amazon FSx

3: Amazon S3

4: AWS Storage Gateway

Answer: 2

Explanation:

Amazon FSx for Windows File Server provides fully managed, highly reliable file storage that is accessible over the industry-standard Server Message Block (SMB) protocol.

Amazon FSx is built on Windows Server and provides a rich set of administrative features that include end-user file restore, user quotas, and Access Control Lists (ACLs).

Additionally, Amazon FSX for Windows File Server supports Distributed File System Replication (DFSR) in both Single-AZ and Multi-AZ deployments.

CORRECT: "Amazon FSx" is the correct answer.

INCORRECT: "Amazon EFS" is incorrect as EFS only supports Linux systems.

INCORRECT: "Amazon S3" is incorrect as this is not a suitable replacement for a Microsoft filesystem.

INCORRECT: "AWS Storage Gateway" is incorrect as this service is primarily used for connecting on-premises storage to cloud storage. It consists of a software device installed on-premises and can be used with SMB shares but it actually stores the data on S3. It is also used for migration. However, in this case the company need to replace the file server farm and Amazon FSx is the best choice for this job.

6. Question

A website runs on Amazon EC2 instances in an Auto Scaling group behind an Application Load Balancer (ALB) which serves as an origin for an Amazon CloudFront distribution. An AWS WAF is being used to protect against SQL injection attacks. A review of security logs revealed an external malicious IP that needs to be blocked from accessing the website.

What should a solutions architect do to protect the application?

1: Modify the network ACL on the CloudFront distribution to add a deny rule for the malicious IP address

2: Modify the configuration of AWS WAF to add an IP match condition to block the malicious IP address

3: Modify the network ACL for the EC2 instances in the target groups behind the ALB to deny the malicious IP address

4: Modify the security groups for the EC2 instances in the target groups behind the ALB to deny the malicious IP address

Answer: 2

Explanation:

A new version of the AWS Web Application Firewall was released in November 2019. With AWS WAF classic you create “IP match conditions”, whereas with AWS WAF (new version) you create “IP set match statements”. Look out for wording on the exam.

The IP match condition / IP set match statement inspects the IP address of a web request's origin against a set of IP addresses and address ranges. Use this to allow or block web requests based on the IP addresses that the requests originate from.

AWS WAF supports all IPv4 and IPv6 address ranges. An IP set can hold up to 10,000 IP addresses or IP address ranges to check.

CORRECT: "Modify the configuration of AWS WAF to add an IP match condition to block the malicious IP address" is the correct answer.

INCORRECT: "Modify the network ACL on the CloudFront distribution to add a deny rule for the malicious IP address" is incorrect as CloudFront does not sit within a subnet so network ACLs do not apply to it.

INCORRECT: "Modify the network ACL for the EC2 instances in the target groups behind the ALB to deny the malicious IP address" is incorrect as the source IP addresses of the data in the EC2 instances’ subnets will be the ELB IP addresses.

INCORRECT: "Modify the security groups for the EC2 instances in the target groups behind the ALB to deny the malicious IP address." is incorrect as you cannot create deny rules with security groups.

7. Question

An ecommerce website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The application is stateless and elastic and scales from a minimum of 10 instances, up to a maximum of 200 instances. For at least 80% of the time at least 40 instances are required.

Which solution should be used to minimize costs?

1: Purchase Reserved Instances to cover 200 instances

2: Purchase Reserved Instances to cover 80 instances. Use Spot Instances to cover the remaining instances

3: Purchase On-Demand Instances to cover 40 instances. Use Spot Instances to cover the remaining instances

4: Purchase Reserved Instances to cover 40 instances. Use On-Demand and Spot Instances to cover the remaining instances

Answer: 4

Explanation:

In this case at least 40 instances are required for 80% of the time which means they are good candidates for reserved instances which can provide discounts of up to 72% over on-demand instances. For the remainder of instances on-demand and Spot instances should be used. Spot can be used as the application is stateless and this will minimize costs and on-demand can be used when Spot instances aren't available or the price is not beneficial.

CORRECT: "Purchase Reserved Instances to cover 40 instances. Use On-Demand and Spot Instances to cover the remaining instances" is the correct answer.

INCORRECT: "Purchase On-Demand Instances to cover 40 instances. Use Spot Instances to cover the remaining instances" is incorrect as on-demand instances will not minimize costs. For the instances that will be required at a minimum, reserved instances should be used.

INCORRECT: "Purchase Reserved Instances to cover 200 instances" is incorrect as these extra instances above 40 instances are only used for less and 20% of the time. It would better to reserve 40 instances only.

INCORRECT: "Purchase Reserved Instances to cover 80 instances. Use Spot Instances to cover the remaining instances" is incorrect as only 40 instances should be reserved as these are used 80% of the time. The remainder should be spot instances.

8. Question

A solutions architect is creating a system that will run analytics on financial data for 4 hours a night, 5 days a week. The analysis is expected to run for the same duration and cannot be interrupted once it is started. The system will be required for a minimum of 1 year.

Which type of Amazon EC2 instances should be used to reduce the cost of the system?

1: Spot Instances

2: On-Demand Instances

3: Standard Reserved Instances

4: Scheduled Reserved Instances

Answer: 4

Explanation:

Scheduled Reserved Instances (Scheduled Instances) enable you to purchase capacity reservations that recur on a daily, weekly, or monthly basis, with a specified start time and duration, for a one-year term. You reserve the capacity in advance, so that you know it is available when you need it. You pay for the time that the instances are scheduled, even if you do not use them.

Scheduled Instances are a good choice for workloads that do not run continuously, but do run on a regular schedule. For example, you can use Scheduled Instances for an application that runs during business hours or for batch processing that runs at the end of the week.

CORRECT: "Scheduled Reserved Instances" is the correct answer.

INCORRECT: "Standard Reserved Instances" is incorrect as the workload only runs for 4 hours a day this would be more expensive.

INCORRECT: "On-Demand Instances" is incorrect as this would be much more expensive as there is no discount applied.

INCORRECT: "Spot Instances" is incorrect as the workload cannot be interrupted once started. With Spot instances workloads can be terminated if the Spot price changes or capacity is required.

9. Question

A solutions architect needs to backup some application log files from an online ecommerce store to Amazon S3. It is unknown how often the logs will be accessed or which logs will be accessed the most. The solutions architect must keep costs as low as possible by using the appropriate S3 storage class.

Which S3 storage class should be implemented to meet these requirements?

1: S3 Glacier
2: S3 Intelligent-Tiering
3: S3 Standard-Infrequent Access (S3 Standard-IA)
4: S3 One Zone-Infrequent Access (S3 One Zone-IA)

Answer: 2

Explanation:

The S3 Intelligent-Tiering storage class is designed to optimize costs by automatically moving data to the most cost-effective access tier, without performance impact or operational overhead.

It works by storing objects in two access tiers: one tier that is optimized for frequent access and another lower-cost tier that is optimized for infrequent access. This is an ideal use case for intelligent-tiering as the access patterns for the log files are not known.

CORRECT: "S3 Intelligent-Tiering" is the correct answer.

INCORRECT: "S3 Standard-Infrequent Access (S3 Standard-IA)" is incorrect as if the data is accessed often retrieval fees could become expensive.

INCORRECT: "S3 One Zone-Infrequent Access (S3 One Zone-IA)" is incorrect as if the data is accessed often retrieval fees could become expensive.

INCORRECT: "S3 Glacier" is incorrect as if the data is accessed often retrieval fees could become expensive. Glacier also requires more work in retrieving the data from the archive and quick access requirements can add further costs.

10. Question

A solutions architect is designing a new service that will use an Amazon API Gateway API on the frontend. The service will need to persist data in a backend database using key-value requests. Initially, the data requirements will be around 1 GB and future growth is unknown. Requests can range from 0 to over 800 requests per second.

Which combination of AWS services would meet these requirements? (Select TWO)

1: AWS Fargate

2: AWS Lambda
3: Amazon DynamoDB
4: Amazon EC2 Auto Scaling
5: Amazon RDS

Answer: 2, 3

Explanation:

In this case AWS Lambda can perform the computation and store the data in an Amazon DynamoDB table. Lambda can scale concurrent executions to meet demand easily and DynamoDB is built for key-value data storage requirements and is also serverless and easily scalable. This is therefore a cost effective solution for unpredictable workloads.

CORRECT: "AWS Lambda" is a correct answer.

CORRECT: "Amazon DynamoDB" is also a correct answer.

INCORRECT: "AWS Fargate" is incorrect as containers run constantly and therefore incur costs even when no requests are being made.

INCORRECT: "Amazon EC2 Auto Scaling" is incorrect as this uses EC2 instances which will incur costs even when no requests are being made.

INCORRECT: "Amazon RDS" is incorrect as this is a relational database not a No-SQL database. It is therefore not suitable for key-value data storage requirements.

11. Question

A company's application is running on Amazon EC2 instances in a single Region. In the event of a disaster, a solutions architect needs to ensure that the resources can also be deployed to a second Region. Which combination of actions should the solutions architect take to accomplish this? (Select TWO)

1: Detach a volume on an EC2 instance and copy it to an Amazon S3 bucket in the second Region

2: Launch a new EC2 instance from an Amazon Machine Image (AMI) in the second Region

3: Launch a new EC2 instance in the second Region and copy a volume from Amazon S3 to the new instance

4: Copy an Amazon Machine Image (AMI) of an EC2 instance and specify the second Region for the destination

5: Copy an Amazon Elastic Block Store (Amazon EBS) volume from Amazon S3 and launch an EC2 instance in the second Region using that EBS volume

Answer: 2, 4

Explanation:

You can copy an Amazon Machine Image (AMI) within or across AWS Regions using the AWS Management Console, the AWS Command Line Interface or SDKs, or the Amazon EC2 API, all of which support the CopyImage action.

Using the copied AMI the solutions architect would then be able to launch an instance from the same EBS volume in the second Region.

Note: the AMIs are stored on Amazon S3, however you cannot view them in the S3 management console or work with them programmatically using the S3 API.

CORRECT: "Copy an Amazon Machine Image (AMI) of an EC2 instance and specify the second Region for the destination" is a correct answer.

CORRECT: "Launch a new EC2 instance from an Amazon Machine Image (AMI) in the second Region" is also a correct answer.

INCORRECT: "Detach a volume on an EC2 instance and copy it to an Amazon S3 bucket in the second Region" is incorrect. You cannot copy EBS volumes directly from EBS to Amazon S3.

INCORRECT: "Launch a new EC2 instance in the second Region and copy a volume from Amazon S3 to the new instance" is incorrect. You cannot create an EBS volume directly from Amazon S3.

INCORRECT: "Copy an Amazon Elastic Block Store (Amazon EBS) volume from Amazon S3 and launch an EC2 instance in the second Region using that EBS volume" is incorrect. You cannot create an EBS volume directly from Amazon S3.

12. Question

A solutions architect is creating a document submission application for a school. The application will use an Amazon S3 bucket for storage. The solution must prevent accidental deletion of the documents and ensure

that all versions of the documents are available. Users must be able to upload and modify the documents.

Which combination of actions should be taken to meet these requirements? (Select TWO)

1: Set read-only permissions on the bucket

2: Enable versioning on the bucket

3: Attach an IAM policy to the bucket

4: Enable MFA Delete on the bucket

5: Encrypt the bucket using AWS SSE-S3

Answer: 2, 4

Explanation:

None of the options present a good solution for specifying permissions required to write and modify objects so that requirement needs to be taken care of separately. The other requirements are to prevent accidental deletion and the ensure that all versions of the document are available.

The two solutions for these requirements are versioning and MFA delete. Versioning will retain a copy of each version of the document and multi-factor authentication delete (MFA delete) will prevent any accidental deletion as you need to supply a second factor when attempting a delete.

CORRECT: "Enable versioning on the bucket" is a correct answer.

CORRECT: "Enable MFA Delete on the bucket" is also a correct answer.

INCORRECT: "Set read-only permissions on the bucket" is incorrect as this will also prevent any writing to the bucket which is not desired.

INCORRECT: "Attach an IAM policy to the bucket" is incorrect as users need to modify documents which will also allow delete. Therefore, a method must be implemented to just control deletes.

INCORRECT: "Encrypt the bucket using AWS SSE-S3" is incorrect as encryption doesn’t stop you from deleting an object.

13. Question

A solutions architect is designing an application on AWS. The compute layer will run in parallel across EC2 instances. The compute layer should scale based on the number of jobs to be processed. The compute

layer is stateless. The solutions architect must ensure that the application is loosely coupled and the job items are durably stored.

Which design should the solutions architect use?

1: Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on CPU usage

2: Create an Amazon SQS queue to hold the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on network usage

3: Create an Amazon SQS queue to hold the jobs that needs to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of items in the SQS queue

4: Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of messages published to the SNS topic

Answer: 3

Explanation:

In this case we need to find a durable and loosely coupled solution for storing jobs. Amazon SQS is ideal for this use case and can be configured to use dynamic scaling based on the number of jobs waiting in the queue.

To configure this scaling you can use the *backlog per instance* metric with the target value being the *acceptable backlog per instance* to maintain. You can calculate these numbers as follows:

- **Backlog per instance** : To calculate your backlog per instance, start with the ApproximateNumberOfMessages queue attribute to determine the length of the SQS queue (number of messages available for retrieval from the queue). Divide that number by the fleet's running capacity, which for an Auto Scaling group is the number of instances in the InService state, to get the backlog per instance.
- **Acceptable backlog per instance** : To calculate your target value, first determine what your application can accept in terms of latency.

Then, take the acceptable latency value and divide it by the average time that an EC2 instance takes to process a message.

This solution will scale EC2 instances using Auto Scaling based on the number of jobs waiting in the SQS queue.

CORRECT: "Create an Amazon SQS queue to hold the jobs that needs to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of items in the SQS queue" is the correct answer.

INCORRECT: "Create an Amazon SQS queue to hold the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on network usage" is incorrect as scaling on network usage does not relate to the number of jobs waiting to be processed.

INCORRECT: "Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on CPU usage" is incorrect. Amazon SNS is a notification service so it delivers notifications to subscribers. It does store data durably but is less suitable than SQS for this use case. Scaling on CPU usage is not the best solution as it does not relate to the number of jobs waiting to be processed.

INCORRECT: "Create an Amazon SNS topic to send the jobs that need to be processed. Create an Amazon EC2 Auto Scaling group for the compute application. Set the scaling policy for the Auto Scaling group to add and remove nodes based on the number of messages published to the SNS topic" is incorrect. Amazon SNS is a notification service so it delivers notifications to subscribers. It does store data durably but is less suitable than SQS for this use case. Scaling on the number of notifications in SNS is not possible.

14. Question

A team are planning to run analytics jobs on log files each day and require a storage solution. The size and number of logs is unknown and data will persist for 24 hours only.

What is the MOST cost-effective solution?

1: Amazon S3 Glacier Deep Archive

2: Amazon S3 Standard
3: Amazon S3 Intelligent-Tiering
4: Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)

Answer: 2

Explanation:

S3 standard is the best choice in this scenario for a short term storage solution. In this case the size and number of logs is unknown and it would be difficult to fully assess the access patterns at this stage. Therefore, using S3 standard is best as it is cost-effective, provides immediate access, and there are no retrieval fees or minimum capacity charge per object.

CORRECT: "Amazon S3 Standard" is the correct answer.

INCORRECT: "Amazon S3 Intelligent-Tiering" is incorrect as there is an additional fee for using this service and for a short-term requirement it may not be beneficial.

INCORRECT: "Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)" is incorrect as this storage class has a minimum capacity charge per object (128 KB) and a per GB retrieval fee.

INCORRECT: "Amazon S3 Glacier Deep Archive" is incorrect as this storage class is used for archiving data. There are retrieval fees and it take hours to retrieve data from an archive.

15. Question

A company runs a web application that serves weather updates. The application runs on a fleet of Amazon EC2 instances in a Multi-AZ Auto scaling group behind an Application Load Balancer (ALB). The instances store data in an Amazon Aurora database. A solutions architect needs to make the application more resilient to sporadic increases in request rates.

Which architecture should the solutions architect implement? (Select TWO)

1: Add and AWS WAF in front of the ALB
2: Add Amazon Aurora Replicas
3: Add an AWS Transit Gateway to the Availability Zones
4: Add an AWS Global Accelerator endpoint

5: Add an Amazon CloudFront distribution in front of the ALB

Answer: 2, 5

Explanation:

The architecture is already highly resilient but may be subject to performance degradation if there are sudden increases in request rates. To resolve this situation Amazon Aurora Read Replicas can be used to serve read traffic which offloads requests from the main database. On the frontend an Amazon CloudFront distribution can be placed in front of the ALB and this will cache content for better performance and also offloads requests from the backend.

CORRECT: "Add Amazon Aurora Replicas" is the correct answer.

CORRECT: "Add an Amazon CloudFront distribution in front of the ALB" is the correct answer.

INCORRECT: "Add and AWS WAF in front of the ALB" is incorrect. A web application firewall protects applications from malicious attacks. It does not improve performance.

INCORRECT: "Add an AWS Transit Gateway to the Availability Zones" is incorrect as this is used to connect on-premises networks to VPCs.

INCORRECT: "Add an AWS Global Accelerator endpoint" is incorrect as this service is used for directing users to different instances of the application in different regions based on latency.

16. Question

An Amazon VPC contains several Amazon EC2 instances. The instances need to make API calls to Amazon DynamoDB. A solutions architect needs to ensure that the API calls do not traverse the internet.

How can this be accomplished? (Select TWO)

1: Create a route table entry for the endpoint

2: Create a gateway endpoint for DynamoDB

3: Create a new DynamoDB table that uses the endpoint

4: Create an ENI for the endpoint in each of the subnets of the VPC

5: Create a VPC peering connection between the VPC and DynamoDB

Answer: 1, 2

Explanation:

Amazon DynamoDB and Amazon S3 support gateway endpoints, not interface endpoints. With a gateway endpoint you create the endpoint in the VPC, attach a policy allowing access to the service, and then specify the route table to create a route table entry in.

CORRECT: "Create a route table entry for the endpoint" is a correct answer.

CORRECT: "Create a gateway endpoint for DynamoDB" is also a correct answer.

INCORRECT: "Create a new DynamoDB table that uses the endpoint" is incorrect as it is not necessary to create a new DynamoDB table.

INCORRECT: "Create an ENI for the endpoint in each of the subnets of the VPC" is incorrect as an ENI is used by an interface endpoint, not a gateway endpoint.

INCORRECT: "Create a VPC peering connection between the VPC and DynamoDB" is incorrect as you cannot create a VPC peering connection between a VPC and a public AWS service as public services are outside of VPCs.

17. Question

A solutions architect is designing the infrastructure to run an application on Amazon EC2 instances. The application requires high availability and must dynamically scale based on demand to be cost efficient.

What should the solutions architect do to meet these requirements?

1: Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Regions

2: Configure an Amazon CloudFront distribution in front of an Auto Scaling group to deploy instances to multiple Regions

3: Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Availability Zones

4: Configure an Amazon API Gateway API in front of an Auto Scaling group to deploy instances to multiple Availability Zones

Answer: 3

Explanation:

The Amazon EC2-based application must be highly available and elastically scalable. Auto Scaling can provide the elasticity by dynamically launching and terminating instances based on demand. This can take place across availability zones for high availability.

Incoming connections can be distributed to the instances by using an Application Load Balancer (ALB).

CORRECT: "Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Availability Zones" is the correct answer.

INCORRECT: "Configure an Amazon API Gateway API in front of an Auto Scaling group to deploy instances to multiple Availability Zones" is incorrect as API gateway is not used for load balancing connections to Amazon EC2 instances.

INCORRECT: "Configure an Application Load Balancer in front of an Auto Scaling group to deploy instances to multiple Regions" is incorrect as you cannot launch instances in multiple Regions from a single Auto Scaling group.

INCORRECT: "Configure an Amazon CloudFront distribution in front of an Auto Scaling group to deploy instances to multiple Regions" is incorrect as you cannot launch instances in multiple Regions from a single Auto Scaling group.

18. Question

A retail company with many stores and warehouses is implementing IoT sensors to gather monitoring data from devices in each location. The data will be sent to AWS in real time. A solutions architect must provide a solution for ensuring events are received in order for each device and ensure that data is saved for future processing.

Which solution would be MOST efficient?

1: Use Amazon Kinesis Data Streams for real-time events with a partition key for each device. Use Amazon Kinesis Data Firehose to save data to Amazon S3

2: Use Amazon Kinesis Data Streams for real-time events with a shard for each device. Use Amazon Kinesis Data Firehose to save data to Amazon EBS

3: Use an Amazon SQS FIFO queue for real-time events with one queue for each device. Trigger an AWS Lambda function for the SQS queue to save data to Amazon EFS

4: Use an Amazon SQS standard queue for real-time events with one queue for each device. Trigger an AWS Lambda function from the SQS queue to save data to Amazon S3

Answer: 1

Explanation:

Amazon Kinesis Data Streams collect and process data in real time. A *Kinesis data stream* is a set of shards. Each shard has a sequence of data records. Each data record has a sequence number that is assigned by Kinesis Data Streams. A *shard* is a uniquely identified sequence of data records in a stream.

A *partition key* is used to group data by shard within a stream. Kinesis Data Streams segregates the data records belonging to a stream into multiple shards. It uses the partition key that is associated with each data record to determine which shard a given data record belongs to.

For this scenario, the solutions architect can use a partition key for each device. This will ensure the records for that device are grouped by shard and the shard will ensure ordering. Amazon S3 is a valid destination for saving the data records.

CORRECT: "Use Amazon Kinesis Data Streams for real-time events with a partition key for each device. Use Amazon Kinesis Data Firehose to save data to Amazon S3" is the correct answer.

INCORRECT: "Use Amazon Kinesis Data Streams for real-time events with a shard for each device. Use Amazon Kinesis Data Firehose to save data to Amazon EBS" is incorrect as you cannot save data to EBS from Kinesis.

INCORRECT: "Use an Amazon SQS FIFO queue for real-time events with one queue for each device. Trigger an AWS Lambda function for the SQS queue to save data to Amazon EFS" is incorrect as SQS is not the most efficient service for streaming, real time data.

INCORRECT: "Use an Amazon SQS standard queue for real-time events with one queue for each device. Trigger an AWS Lambda function from the

SQS queue to save data to Amazon S3" is incorrect as SQS is not the most efficient service for streaming, real time data.

19. Question

An organization want to share regular updates about their charitable work using static webpages. The pages are expected to generate a large amount of views from around the world. The files are stored in an Amazon S3 bucket. A solutions architect has been asked to design an efficient and effective solution.

Which action should the solutions architect take to accomplish this?

1: Generate presigned URLs for the files

2: Use cross-Region replication to all Regions

3: Use the geoproximity feature of Amazon Route 53

4: Use Amazon CloudFront with the S3 bucket as its origin

Answer: 4

Explanation:

Amazon CloudFront can be used to cache the files in edge locations around the world and this will improve the performance of the webpages.

To serve a static website hosted on Amazon S3, you can deploy a CloudFront distribution using one of these configurations:

- Using a REST API endpoint as the origin with access restricted by an origin access identity (OAI)
- Using a website endpoint as the origin with anonymous (public) access allowed
- Using a website endpoint as the origin with access restricted by a Referer header

CORRECT: "Use Amazon CloudFront with the S3 bucket as its origin" is the correct answer.

INCORRECT: "Generate presigned URLs for the files" is incorrect as this is used to restrict access which is not a requirement.

INCORRECT: "Use cross-Region replication to all Regions" is incorrect as this does not provide a mechanism for directing users to the closest copy of the static webpages.

INCORRECT: "Use the geoproximity feature of Amazon Route 53" is incorrect as this does not include a solution for having multiple copies of the data in different geographic lcoations.

20. Question

An insurance company has a web application that serves users in the United Kingdom and Australia. The application includes a database tier using a MySQL database hosted in eu-west-2. The web tier runs from eu-west-2 and ap-southeast-2. Amazon Route 53 geoproximity routing is used to direct users to the closest web tier. It has been noted that Australian users receive slow response times to queries.

Which changes should be made to the database tier to improve performance?

1: Migrate the database to Amazon RDS for MySQL. Configure Multi-AZ in the Australian Region

2: Migrate the database to Amazon DynamoDB. Use DynamoDB global tables to enable replication to additional Regions

3: Deploy MySQL instances in each Region. Deploy an Application Load Balancer in front of MySQL to reduce the load on the primary instance

4: Migrate the database to an Amazon Aurora global database in MySQL compatibility mode. Configure read replicas in ap-southeast-2

Answer: 4

Explanation:

The issue here is latency with read queries being directed from Australia to UK which is great physical distance. A solution is required for improving read performance in Australia.

An Aurora global database consists of one primary AWS Region where your data is mastered, and up to five read-only, secondary AWS Regions. Aurora replicates data to the secondary AWS Regions with typical latency of under a second. You issue write operations directly to the primary DB instance in the primary AWS Region.

This solution will provide better performance for users in the Australia Region for queries. Writes must still take place in the UK Region but read performance will be greatly improved.

CORRECT: "Migrate the database to an Amazon Aurora global database in MySQL compatibility mode. Configure read replicas in ap-southeast-2" is the correct answer.

INCORRECT: "Migrate the database to Amazon RDS for MySQL. Configure Multi-AZ in the Australian Region" is incorrect. The database is located in UK. If the database is migrated to Australia then the reverse problem will occur. Multi-AZ does not assist with improving query performance across Regions.

INCORRECT: "Migrate the database to Amazon DynamoDB. Use DynamoDB global tables to enable replication to additional Regions" is incorrect as a relational database running on MySQL is unlikely to be compatible with DynamoDB.

INCORRECT: "Deploy MySQL instances in each Region. Deploy an Application Load Balancer in front of MySQL to reduce the load on the primary instance" is incorrect as you can only put ALBs in front of the web tier, not the DB tier.

21. Question

A web application runs in public and private subnets. The application architecture consists of a web tier and database tier running on Amazon EC2 instances. Both tiers run in a single Availability Zone (AZ).

Which combination of steps should a solutions architect take to provide high availability for this architecture? (Select TWO)

1: Create new public and private subnets in the same AZ for high availability

2: Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs

3: Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)

4: Create new public and private subnets in a new AZ. Create a database using Amazon EC2 in one AZ

5: Create new public and private subnets in the same VPC, each in a new AZ. Migrate the database to an Amazon RDS multi-AZ deployment

Answer: 2, 5

Explanation:

To add high availability to this architecture both the web tier and database tier require changes. For the web tier an Auto Scaling group across multiple AZs with an ALB will ensure there are always instances running and traffic is being distributed to them.

The database tier should be migrated from the EC2 instances to Amazon RDS to take advantage of a managed database with Multi-AZ functionality. This will ensure that if there is an issue preventing access to the primary database a secondary database can take over.

CORRECT: "Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs" is the correct answer.

CORRECT: "Create new public and private subnets in the same VPC, each in a new AZ. Migrate the database to an Amazon RDS multi-AZ deployment" is the correct answer.

INCORRECT: "Create new public and private subnets in the same AZ for high availability" is incorrect as this would not add high availability.

INCORRECT: "Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)" is incorrect because the existing servers are in a single subnet. For HA we need to instances in multiple subnets.

INCORRECT: "Create new public and private subnets in a new AZ. Create a database using Amazon EC2 in one AZ" is incorrect because we also need HA for the database layer.

22. Question

An application running on an Amazon ECS container instance using the EC2 launch type needs permissions to write data to Amazon DynamoDB.

How can you assign these permissions only to the specific ECS task that is running the application?

1: Create an IAM policy with permissions to DynamoDB and attach it to the container instance

2: Create an IAM policy with permissions to DynamoDB and assign It to a task using the *taskRoleArn* parameter

3: Use a security group to allow outbound connections to DynamoDB and assign it to the container instance

4: Modify the *AmazonECSTaskExecutionRolePolicy* policy to add permissions for DynamoDB

Answer: 2

Explanation:

To specify permissions for a specific task on Amazon ECS you should use IAM Roles for Tasks. The permissions policy can be applied to tasks when creating the task definition, or by using an IAM task role override using the AWS CLI or SDKs. The *taskRoleAr* n parameter is used to specify the policy.

CORRECT: "Create an IAM policy with permissions to DynamoDB and assign It to a task using the *taskRoleArn* parameter" is the correct answer.

INCORRECT: "Create an IAM policy with permissions to DynamoDB and attach it to the container instance" is incorrect. You should not apply the permissions to the container instance as they will then apply to all tasks running on the instance as well as the instance itself.

INCORRECT: "Use a security group to allow outbound connections to DynamoDB and assign it to the container instance" is incorrect. Though you will need a security group to allow outbound connections to DynamoDB, the question is asking how to assign permissions to write data to DynamoDB and a security group cannot provide those permissions.

INCORRECT: "Modify the *AmazonECSTaskExecutionRolePolicy* policy to add permissions for DynamoDB" is incorrect. The *AmazonECSTaskExecutionRolePolicy* policy is the Task Execution IAM Role. This is used by the container agent to be able to pull container images, write log file etc.

23. Question

An organization has a large amount of data on Windows (SMB) file shares in their on-premises data center. The organization would like to move data into Amazon S3. They would like to automate the migration of data over their AWS Direct Connect link.

Which AWS service can assist them?

1: AWS Database Migration Service (DMS)

2: AWS CloudFormation

3: AWS Snowball

4: AWS DataSync

Answer: 4

Explanation:

AWS DataSync can be used to move large amounts of data online between on-premises storage and Amazon S3 or Amazon Elastic File System (Amazon EFS). DataSync eliminates or automatically handles many of these tasks, including scripting copy jobs, scheduling and monitoring transfers, validating data, and optimizing network utilization. The source datastore can be Server Message Block (SMB) file servers.

CORRECT: "AWS DataSync" is the correct answer.

INCORRECT: "AWS Database Migration Service (DMS)" is incorrect. AWS Database Migration Service (DMS) is used for migrating databases, not data on file shares.

INCORRECT: "AWS CloudFormation" is incorrect. AWS CloudFormation can be used for automating infrastructure provisioning. This is not the best use case for CloudFormation as DataSync is designed specifically for this scenario.

INCORRECT: "AWS Snowball" is incorrect. AWS Snowball is a hardware device that is used for migrating data into AWS. The organization plan to use their Direct Connect link for migrating data rather than sending it in via a physical device. Also, Snowball will not automate the migration.

24. Question

The database tier of a web application is running on a Windows server on-premises. The database is a Microsoft SQL Server database. The application owner would like to migrate the database to an Amazon RDS instance.

How can the migration be executed with minimal administrative effort and downtime?

1: Use the AWS Server Migration Service (SMS) to migrate the server to Amazon EC2.Use AWS Database Migration Service (DMS) to migrate the database to RDS

2: Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS

3: Use AWS DataSync to migrate the data from the database to Amazon S3. Use AWS Database Migration Service (DMS) to migrate the database to RDS

4: Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS. Use the Schema Conversion Tool (SCT) to enable conversion from Microsoft SQL Server to Amazon RDS

Answer: 2

Explanation:

You can directly migrate Microsoft SQL Server from an on-premises server into Amazon RDS using the Microsoft SQL Server database engine. This can be achieved using the native Microsoft SQL Server tools, or using AWS DMS.

CORRECT: "Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS" is the correct answer.

INCORRECT: "Use the AWS Server Migration Service (SMS) to migrate the server to Amazon EC2. Use AWS Database Migration Service (DMS) to migrate the database to RDS" is incorrect. You do not need to use the AWS SMS service to migrate the server into EC2 first. You can directly migrate the database online with minimal downtime.

INCORRECT: "Use AWS DataSync to migrate the data from the database to Amazon S3. Use AWS Database Migration Service (DMS) to migrate the database to RDS" is incorrect. AWS DataSync is used for migrating data, not databases.

INCORRECT: "Use the AWS Database Migration Service (DMS) to directly migrate the database to RDS. Use the Schema Conversion Tool (SCT) to enable conversion from Microsoft SQL Server to Amazon RDS" is incorrect. You do not need to use the SCT as you are migrating into the same destination database engine (RDS is just the platform).

25. Question

A new application will run across multiple Amazon ECS tasks. Front-end application logic will process data and then pass that data to a back-end ECS task to perform further processing and write the data to a datastore. The Architect would like to reduce-interdependencies so failures do no impact other components.

Which solution should the Architect use?

1: Create an Amazon Kinesis Firehose delivery stream and configure the front-end to add data to the stream and the back-end to read data from the stream

2: Create an Amazon Kinesis Firehose delivery stream that delivers data to an Amazon S3 bucket, configure the front-end to write data to the stream and the back-end to read data from Amazon S3

3: Create an Amazon SQS queue that pushes messages to the back-end. Configure the front-end to add messages to the queue

4: Create an Amazon SQS queue and configure the front-end to add messages to the queue and the back-end to poll the queue for messages

Answer: 4

Explanation:

This is a good use case for Amazon SQS. SQS is a service that is used for decoupling applications, thus reducing interdependencies, through a message bus. The front-end application can place messages on the queue and the back-end can then poll the queue for new messages. Please remember that Amazon SQS is pull-based (polling) not push-based (use SNS for push-based).

CORRECT: "Create an Amazon SQS queue and configure the front-end to add messages to the queue and the back-end to poll the queue for messages" is the correct answer.

INCORRECT: "Create an Amazon Kinesis Firehose delivery stream and configure the front-end to add data to the stream and the back-end to read data from the stream" is incorrect. Amazon Kinesis Firehose is used for streaming data. With Firehose the data is immediately loaded into a destination that can be Amazon S3, RedShift, Elasticsearch, or Splunk. This is not an ideal use case for Firehose as this is not streaming data and there is no need to load data into an additional AWS service.

INCORRECT: "Create an Amazon Kinesis Firehose delivery stream that delivers data to an Amazon S3 bucket, configure the front-end to write data to the stream and the back-end to read data from Amazon S3" is incorrect as per the previous explanation.

INCORRECT: "Create an Amazon SQS queue that pushes messages to the back-end. Configure the front-end to add messages to the queue " is

incorrect as SQS is pull-based, not push-based. EC2 instances must poll the queue to find jobs to process.

26. Question

An application receives images uploaded by customers and stores them on Amazon S3. An AWS Lambda function then processes the images to add graphical elements. The processed images need to be available for users to download for 30 days, after which time they can be deleted. Processed images can be easily recreated from original images. The Original images need to be immediately available for 30 days and be accessible within 24 hours for another 90 days.

Which combination of Amazon S3 storage classes is most cost-effective for the original and processed images? (Select TWO)

1: Store the original images in STANDARD for 30 days, transition to GLACIER for 90 days, then expire the data

2: Store the original images in STANDARD_IA for 30 days and then transition to DEEP_ARCHIVE

3: Store the processed images in ONEZONE_IA and then expire the data after 30 days

4: Store the processed images in STANDARD and then transition to GLACIER after 30 days

5: Store the original images in STANDARD for 30 days, transition to DEEP_ARCHIVE for 90 days, then expire the data

Answer: 1,3

Explanation:

The key requirements for the original images are that they are immediately available for 30 days (STANDARD), available within 24 hours for 90 days (GLACIER) and then they are not needed (expire them).

The key requirements for the processed images are that they are immediately available for 30 days (ONEZONE_IA as they can be recreated from the originals), and then are not needed (expire them).

CORRECT: "Store the original images in STANDARD for 30 days, transition to GLACIER for 90 days, then expire the data" is a correct answer.

CORRECT: "Store the processed images in ONEZONE_IA and then expire the data after 30 days" is also a correct answer.

INCORRECT: "Store the original images in STANDARD_IA for 30 days and then transition to DEEP_ARCHIVE" is incorrect. DEEP_ARCHIVE has a minimum storage duration of 180 days.

INCORRECT: "Store the processed images in STANDARD and then transition to GLACIER after 30 days" is incorrect. There is no need to transition the processed images to GLACIER as are not needed after 30 days as they can be recreated if needed from the originals.

INCORRECT: "Store the original images in STANDARD for 30 days, transition to DEEP_ARCHIVE for 90 days, then expire the data" is incorrect. DEEP_ARCHIVE has a minimum storage duration of 180 days.

27. Question

Amazon EC2 instances in a development environment run between 9am and 5pm Monday-Friday. Production instances run 24/7. Which pricing models should be used? (Select TWO)

1: Use Spot instances for the development environment

2: Use Reserved instances for the development environment

3: Use scheduled reserved instances for the development environment

4: Use Reserved instances for the production environment

5: Use On-Demand instances for the production environment

Answer: 3,4

Explanation:

Scheduled Instances are a good choice for workloads that do not run continuously but do run on a regular schedule. This is ideal for the development environment.

Reserved instances are a good choice for workloads that run continuously. This is a good option for the production environment **.**

CORRECT: "Use scheduled reserved instances for the development environment" is a correct answer.

CORRECT: "Use Reserved instances for the production environment" is also a correct answer.

INCORRECT: "Use Spot instances for the development environment" is incorrect. Spot Instances are a cost-effective choice if you can be flexible about when your applications run and if your applications can be interrupted.

Spot instances are not suitable for the development environment as important work may be interrupted.

INCORRECT: "Use Reserved instances for the development environment" is incorrect as they should be used for the production environment.

INCORRECT: "Use On-Demand instances for the production environment" is incorrect. There is no long-term commitment required when you purchase On-Demand Instances. However, you do not get any discount and therefore this is the most expensive option.

28. Question

An application running on Amazon EC2 needs to asynchronously invoke an AWS Lambda function to perform data processing. The services should be decoupled.

Which service can be used to decouple the compute services?

1: Amazon SQS

2: Amazon SNS

3: Amazon MQ

4: AWS Step Functions

Answer: 2

Explanation:

You can use a Lambda function to process Amazon Simple Notification Service notifications. Amazon SNS supports Lambda functions as a target for messages sent to a topic. This solution decouples the Amazon EC2 application from Lambda and ensures the Lambda function is invoked.

CORRECT: "Amazon SNS" is the correct answer.

INCORRECT: "Amazon SQS" is incorrect. You cannot invoke a Lambda function using Amazon SQS. Lambda can be configured to poll a queue, as SQS is pull-based, but it is not push-based like SNS which is what this solution is looking for.

INCORRECT: "Amazon MQ" is incorrect. Amazon MQ is similar to SQS but is used for existing applications that are being migrated into AWS. SQS should be used for new applications being created in the cloud.

INCORRECT: "AWS Step Functions" is incorrect. AWS Step Functions is a workflow service. It is not the best solution for this scenario.

29. Question

A manual script that runs a few times a week and completes within 10 minutes needs to be replaced with an automated solution. Which of the following options should an Architect use?

1: Use a cron job on an Amazon EC2 instance

2: Use AWS Batch

3: Use AWS Lambda

4: Use AWS CloudFormation

Answer: 3

Explanation:

AWS Lambda has a maximum execution time of 900 seconds (15 minutes). Therefore the script will complete within this time. AWS Lambda is the best solution as you don't need to run any instances (it's serverless) and therefore you will pay only for the execution time.

CORRECT: "Use AWS Lambda" is the correct answer.

INCORRECT: "Use a cron job on an Amazon EC2 instance" is incorrect. Cron Jobs are used for scheduling tasks to run on Linux instances. They are used for automating maintenance and administration. This is a workable solution for running a script but does require the instance to be running all the time. Also, AWS prefer you to use services such as AWS Lambda for centralized control and administration.

INCORRECT: "Use AWS Batch" is incorrect. AWS Batch is used for running large numbers of batch computing jobs on AWS. AWS Batch dynamically provisions the EC2 instances. This is not a good solution for an ad-hoc use case such as this one where you just need to run a single script a few times a week.

INCORRECT: "Use AWS CloudFormation" is incorrect. AWS CloudFormation is used for launching infrastructure. You can use scripts with AWS CloudFormation but its more about running scripts related to infrastructure provisioning.

30. Question

A company wishes to restrict access to their Amazon DynamoDB table to specific, private source IP addresses from their VPC. What should be

done to secure access to the table?

1: Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)

2: Create a gateway VPC endpoint and add an entry to the route table

3: Create the Amazon DynamoDB table in the VPC

4: Create an AWS VPN connection to the Amazon DynamoDB endpoint

Answer: 2

Explanation:

There are two different types of VPC endpoint: interface endpoint, and gateway endpoint. With an interface endpoint you use an ENI in the VPC. With a gateway endpoint you configure your route table to point to the endpoint. Amazon S3 and DynamoDB use gateway endpoints. This solution means that all traffic will go through the VPC endpoint straight to DynamoDB using private IP addresses.

CORRECT: "Create a gateway VPC endpoint and add an entry to the route table" is the correct answer.

INCORRECT: "Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)" is incorrect. As mentioned above, an interface endpoint is not used for DynamoDB, you must use a gateway endpoint.

INCORRECT: "Create the Amazon DynamoDB table in the VPC" is incorrect. You cannot create a DynamoDB table in a VPC, to connect securely using private addresses you should use a gateway endpoint instead.

INCORRECT: "Create an AWS VPN connection to the Amazon DynamoDB endpoint" is incorrect. You cannot create an AWS VPN connection to the Amazon DynamoDB endpoint.

31. Question

An AWS Organization has an OU with multiple member accounts in it. The company needs to restrict the ability to launch only specific Amazon EC2 instance types. How can this policy be applied across the accounts with the least effort?

1: Create an SCP with an allow rule that allows launching the specific instance types

2: Create an SCP with a deny rule that denies all but the specific instance types
3: Create an IAM policy to deny launching all but the specific instance types
4: Use AWS Resource Access Manager to control which launch types can be used

Answer: 2

Explanation:

To apply the restrictions across multiple member accounts you must use a Service Control Policy (SCP) in the AWS Organization. The way you would do this is to create a deny rule that applies to anything that does not equal the specific instance type you want to allow.

CORRECT: "Create an SCP with a deny rule that denies all but the specific instance types" is the correct answer.

INCORRECT: "Create an SCP with an allow rule that allows launching the specific instance types" is incorrect as a deny rule is required.

INCORRECT: "Create an IAM policy to deny launching all but the specific instance types" is incorrect. With IAM you need to apply the policy within each account rather than centrally so this would require much more effort.

INCORRECT: "Use AWS Resource Access Manager to control which launch types can be used" is incorrect. AWS Resource Access Manager (RAM) is a service that enables you to easily and securely share AWS resources with any AWS account or within your AWS Organization. It is not used for restricting access or permissions.

32. Question

A new relational database is being deployed on AWS. The performance requirements are unknown. Which database service does not require you to make capacity decisions upfront?

1: Amazon DynamoDB
2: Amazon Aurora Serverless
3: Amazon ElastiCache
4: Amazon RDS

Answer: 2

Explanation:
If you don't know the performance requirements it will be difficult to determine the correct instance type to use. Amazon Aurora Serverless does not require you to make capacity decisions upfront as you do not select an instance type. As a serverless service it will automatically scale as needed.
CORRECT: "Amazon Aurora Serverless" is the correct answer.
INCORRECT: "Amazon DynamoDB" is incorrect. Amazon DynamoDB is not a relational database, it is a NoSQL database.
INCORRECT: "Amazon ElastiCache" is incorrect. Amazon ElastiCache is more suitable for caching and also requires an instance type to be selected.
INCORRECT: "Amazon RDS" is incorrect. Amazon RDS requires an instance type to be selected.

33. Question
An Amazon RDS Read Replica is being deployed in a separate region. The master database is not encrypted but all data in the new region must be encrypted. How can this be achieved?
1: Enable encryption using Key Management Service (KMS) when creating the cross-region Read Replica
2: Encrypt a snapshot from the master DB instance, create an encrypted cross-region Read Replica from the snapshot
3: Enabled encryption on the master DB instance, then create an encrypted cross-region Read Replica
4: Encrypt a snapshot from the master DB instance, create a new encrypted master DB instance, and then create an encrypted cross-region Read Replica

Answer: 4
Explanation:
You cannot create an encrypted Read Replica from an unencrypted master DB instance. You also cannot enable encryption after launch time for the master DB instance. Therefore, you must create a new master DB by taking a snapshot of the existing DB, encrypting it, and then creating the new DB from the snapshot. You can then create the encrypted cross-region Read Replica of the master DB.
CORRECT: "Encrypt a snapshot from the master DB instance, create a new encrypted master DB instance, and then create an encrypted cross-region

Read Replica" is the correct answer.

INCORRECT: "Enable encryption using Key Management Service (KMS) when creating the cross-region Read Replica" is incorrect. All other options will not work due to the limitations explained above.

INCORRECT: "Encrypt a snapshot from the master DB instance, create an encrypted cross-region Read Replica from the snapshot" is incorrect. All other options will not work due to the limitations explained above.

INCORRECT: "Enabled encryption on the master DB instance, then create an encrypted cross-region Read Replica" is incorrect. All other options will not work due to the limitations explained above.

34. Question

A legacy tightly-coupled High Performance Computing (HPC) application will be migrated to AWS. Which network adapter type should be used?

1: Elastic Network Interface (ENI)

2: Elastic Network Adapter (ENA)

3: Elastic Fabric Adapter (EFA)

4: Elastic IP Address

Answer: 3

Explanation:

An Elastic Fabric Adapter is an AWS Elastic Network Adapter (ENA) with added capabilities. The EFA lets you apply the scale, flexibility, and elasticity of the AWS Cloud to tightly-coupled HPC apps. It is ideal for tightly coupled app as it uses the Message Passing Interface (MPI).

CORRECT: "Elastic Fabric Adapter (EFA)" is the correct answer.

INCORRECT: "Elastic Network Interface (ENI)" is incorrect. The ENI is a basic type of adapter and is not the best choice for this use case.

INCORRECT: "Elastic Network Adapter (ENA)" is incorrect. The ENA, which provides Enhanced Networking, does provide high bandwidth and low inter-instance latency but it does not support the features for a tightly-coupled app that the EFA does.

INCORRECT: "Elastic IP Address" is incorrect. An Elastic IP address is just a static public IP address, it is not a type of network adapter.

35. Question

A new application is to be published in multiple regions around the world. The Architect needs to ensure only 2 IP addresses need to be whitelisted. The solution should intelligently route traffic for lowest latency and provide fast regional failover.

How can this be achieved?

1: Launch EC2 instances into multiple regions behind an NLB with a static IP address

2: Launch EC2 instances into multiple regions behind an ALB and use a Route 53 failover routing policy

3: Launch EC2 instances into multiple regions behind an NLB and use AWS Global Accelerator

4: Launch EC2 instances into multiple regions behind an ALB and use Amazon CloudFront with a pair of static IP addresses

Answer: 3

Explanation:

AWS Global Accelerator uses the vast, congestion-free AWS global network to route TCP and UDP traffic to a healthy application endpoint in the closest AWS Region to the user.

This means it will intelligently route traffic to the closest point of presence (reducing latency). Seamless failover is ensured as AWS Global Accelerator uses anycast IP address which means the IP does not change when failing over between regions so there are no issues with client caches having incorrect entries that need to expire.

This is the only solution that provides deterministic failover.

CORRECT: "Launch EC2 instances into multiple regions behind an NLB and use AWS Global Accelerator" is the correct answer.

INCORRECT: "Launch EC2 instances into multiple regions behind an NLB with a static IP address" is incorrect. An NLB with a static IP is a workable solution as you could configure a primary and secondary address in applications. However, this solution does not intelligently route traffic for lowest latency.

INCORRECT: "Launch EC2 instances into multiple regions behind an ALB and use a Route 53 failover routing policy" is incorrect. A Route 53

failover routing policy uses a primary and standby configuration. Therefore, it sends all traffic to the primary until it fails a health check at which time it sends traffic to the secondary. This solution does not intelligently route traffic for lowest latency.

INCORRECT: "Launch EC2 instances into multiple regions behind an ALB and use Amazon CloudFront with a pair of static IP addresses" is incorrect. Amazon CloudFront cannot be configured with “a pair of static IP addresses”.

36. Question

A company is deploying a big data and analytics workload. The analytics will be run from a fleet of thousands of EC2 instances across multiple AZs. Data needs to be stored on a shared storage layer that can be mounted and accessed concurrently by all EC2 instances. Latency is not a concern however extremely high throughput is required.

What storage layer would be most suitable for this requirement?

1: Amazon EFS in General Purpose mode

2: Amazon EFS in Max I/O mode

3: Amazon EBS PIOPS

4: Amazon S3

Answer: 2

Explanation:

Amazon EFS file systems in the Max I/O mode can scale to higher levels of aggregate throughput and operations per second with a tradeoff of slightly higher latencies for file operations. You can also mount EFS filesystems to up to thousands of EC2 instances across multiple AZs

CORRECT: "Amazon EFS in Max I/O mode" is the correct answer.

INCORRECT: "Amazon EFS in General Purpose mode" is incorrect as Max I/O mode should be used for these requirements.

INCORRECT: "Amazon EBS PIOPS" is incorrect. Amazon EBS volumes cannot be shared between instances across AZs.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 is not a storage layer that can be mounted and accessed concurrently.

37. Question

A Solutions Architect is designing a highly-scalable system to track records. Records must remain available for immediate download for three months, and then the records must be deleted.

What's the most appropriate decision for this use case?

1: Store the files on Amazon EBS, and create a lifecycle policy to remove the files after three months

2: Store the files on Amazon Glacier, and create a lifecycle policy to remove the files after three months

3: Store the files on Amazon S3, and create a lifecycle policy to remove the files after three months

4: Store the files on Amazon EFS, and create a lifecycle policy to remove the files after three months

Answer: 3

Explanation:

To manage your objects so that they are stored cost effectively throughout their lifecycle, configure their *Amazon S3 Lifecycle* . An *S3 Lifecycle configuration* is a set of rules that define actions that Amazon S3 applies to a group of objects. There are two types of actions:

- **Transition actions** —Define when objects transition to another storage class . For example, you might choose to transition objects to the S3 Standard-IA storage class 30 days after you created them, or archive objects to the S3 Glacier storage class one year after creating them.

There are costs associated with the lifecycle transition requests.

- **Expiration actions** —Define when objects expire. Amazon S3 deletes expired objects on your behalf.

The lifecycle expiration costs depend on when you choose to expire objects.

The solutions architect can create a lifecycle action using the "expiration action element" which expires objects (deletes them) at the specified time.

CORRECT: "Store the files on Amazon S3, and create a lifecycle policy to remove the files after three months" is the correct answer.

INCORRECT: "Store the files on Amazon EBS, and create a lifecycle policy to remove the files after three months" is incorrect. There is no lifecycle policy available for deleting files on EBS. The Amazon Data

Lifecycle Manager (DLM) feature automates the creation, retention, and deletion of EBS snapshots but not the individual files within an EBS volume.

INCORRECT: "Store the files on Amazon Glacier, and create a lifecycle policy to remove the files after three months" is incorrect. S3 lifecycle actions apply to any storage class, including Glacier, however Glacier would not allow immediate download.

INCORRECT: "Store the files on Amazon EFS, and create a lifecycle policy to remove the files after three months" is incorrect. There is no lifecycle policy available for deleting files on EFS

38. Question

You are a Solutions Architect at Digital Cloud Training. A large multi-national client has requested a design for a multi-region, multi-master database. The client has requested that the database be designed for fast, massively scaled applications for a global user base. The database should be a fully managed service including the replication.

Which AWS service can deliver these requirements?

1: DynamoDB with Global Tables and Multi-Region Replication

2: EC2 instances with EBS replication

3: S3 with Cross Region Replication

4: RDS with Multi-AZ

Answer: 1

Explanation:

Amazon DynamoDB global tables provide a fully managed solution for deploying a multiregion, multi-master database, without having to build and maintain your own replication solution. With global tables you can specify the AWS Regions where you want the table to be available. DynamoDB performs all of the necessary tasks to create identical tables in these Regions and propagate ongoing data changes to all of them.

DynamoDB global tables are ideal for massively scaled applications with globally dispersed users. In such an environment, users expect very fast application performance. Global tables provide automatic multi-master replication to AWS Regions worldwide. They enable you to deliver low-latency data access to your users no matter where they are located.

CORRECT: "DynamoDB with Global Tables and Multi-Region Replication" is the correct answer.

INCORRECT: "EC2 instances with EBS replication" is incorrect. There is no such thing as EBS replication. You could build your own database stack on EC2 with DB-level replication but that is not what is presented in the answer.

INCORRECT: "S3 with Cross Region Replication" is incorrect. S3 is an object store not a multi-master database.

INCORRECT: "RDS with Multi-AZ" is incorrect. RDS with Multi-AZ is not multi-master (only one DB can be written to at a time), and does not span regions.

39. Question

Your company is starting to use AWS to host new web-based applications. A new two-tier application will be deployed that provides customers with access to data records. It is important that the application is highly responsive and retrieval times are optimized. You're looking for a persistent data store that can provide the required performance. From the list below what AWS service would you recommend for this requirement?

1: RDS in a multi-AZ configuration

2: ElastiCache with the Redis engine

3: Kinesis Data Streams

4: ElastiCache with the Memcached engine

Answer: 2

Explanation:

ElastiCache is a web service that makes it easy to deploy and run Memcached or Redis protocol-compliant server nodes in the cloud. The in-memory caching provided by ElastiCache can be used to significantly improve latency and throughput for many read-heavy application workloads or compute-intensive workloads

There are two different database engines with different characteristics.

The correct choice for this scenario is Redis as Redis provides the persistency that is required.

CORRECT: "ElastiCache with the Redis engine" is the correct answer.

INCORRECT: "RDS in a multi-AZ configuration" is incorrect. RDS is not the optimum solution due to the requirement to optimize retrieval times which is a better fit for an in-memory data store such as ElastiCache.

INCORRECT: "Kinesis Data Streams" is incorrect. Kinesis Data Streams is used for processing streams of data, it is not a persistent data store.

INCORRECT: "ElastiCache with the Memcached engine" is incorrect as Memcached does not offer persistence.

40. Question

A Linux instance running in your VPC requires some configuration changes to be implemented locally and you need to run some commands. Which of the following can be used to securely access the instance?

1: SSL/TLS certificate

2: Public key

3: Key Pairs

4: EC2 password

Answer: 3

Explanation:

Amazon EC2 uses public key cryptography to encrypt and decrypt login information. Public key cryptography uses a public key to encrypt a piece of data, and then the recipient uses the private key to decrypt the data. The public and private keys are known as a *key pair* . Public key cryptography enables you to securely access your instances using a private key instead of a password.

A key pair consists of a public key that AWS stores, and a private key file that you store:

- For Windows AMIs, the private key file is required to obtain the password used to log into your instance.
- For Linux AMIs, the private key file allows you to securely SSH into your instance.

CORRECT: "Key Pairs" is the correct answer.

INCORRECT: "SSL/TLS certificate" is incorrect as you cannot securely access an instance to run commands using an SSL/TLS certificate.

INCORRECT: "Public key" is incorrect. You cannot login to an EC2 instance using certificates/public keys.

INCORRECT: "EC2 password" is incorrect. The “EC2 password” might refer to the operating system password. By default you cannot login this way to Linux and must use a key pair. However, this can be enabled by setting a password and updating the /etc/ssh/sshd_config file.

41. Question

A manufacturing company captures data from machines running at customer sites. Currently, thousands of machines send data every 5 minutes, and this is expected to grow to hundreds of thousands of machines in the near future. The data is logged with the intent to be analyzed in the future as needed.

What is the SIMPLEST method to store this streaming data at scale?

1: Create an Amazon EC2 instance farm behind an ELB to store the data in Amazon EBS Cold HDD volumes

2: Create an Amazon SQS queue, and have the machines write to the queue

3: Create an Amazon Kinesis Firehose delivery stream to store the data in Amazon S3

4: Create an Auto Scaling Group of Amazon EC2 instances behind ELBs to write data into Amazon RDS

Answer: 3

Explanation:

Kinesis Data Firehose is the easiest way to load streaming data into data stores and analytics tools. It captures, transforms, and loads streaming data and you can deliver the data to “destinations” including Amazon S3 buckets for later analysis

CORRECT: "Create an Amazon Kinesis Firehose delivery stream to store the data in Amazon S3" is the correct answer.

INCORRECT: "Create an Amazon EC2 instance farm behind an ELB to store the data in Amazon EBS Cold HDD volumes" is incorrect. Storing the data in EBS wold be expensive and as EBS volumes cannot be shared by multiple instances you would have a bottleneck of a single EC2 instance writing the data.

INCORRECT: "Create an Amazon SQS queue, and have the machines write to the queue" is incorrect. Using an SQS queue to store the data is not possible as the data needs to be stored long-term and SQS queues have a maximum retention time of 14 days.

INCORRECT: "Create an Auto Scaling Group of Amazon EC2 instances behind ELBs to write data into Amazon RDS" is incorrect. Writing data into RDS via a series of EC2 instances and a load balancer is more complex and more expensive. RDS is also not an ideal data store for this data.

42. Question

There is a temporary need to share some video files that are stored in a private S3 bucket. The consumers do not have AWS accounts and you need to ensure that only authorized consumers can access the files. What is the best way to enable this access?

1: Enable public read access for the S3 bucket

2: Use CloudFront to distribute the files using authorization hash tags

3: Generate a pre-signed URL and distribute it to the consumers

4: Configure an allow rule in the Security Group for the IP addresses of the consumers

Answer: 3

Explanation:

All objects by default are private. Only the object owner has permission to access these objects. However, the object owner can optionally share objects with others by creating a presigned URL, using their own security credentials, to grant time-limited permission to download the objects.

When you create a presigned URL for your object, you must provide your security credentials, specify a bucket name, an object key, specify the HTTP method (GET to download the object) and expiration date and time. The presigned URLs are valid only for the specified duration.

Anyone who receives the presigned URL can then access the object. For example, if you have a video in your bucket and both the bucket and the object are private, you can share the video with others by generating a presigned URL.

CORRECT: "Generate a pre-signed URL and distribute it to the consumers" is the correct answer.

INCORRECT: "Enable public read access for the S3 bucket" is incorrect. Enabling public read access does not restrict the content to authorized consumers.

INCORRECT: "Use CloudFront to distribute the files using authorization hash tags" is incorrect. You cannot use CloudFront as hash tags are not a CloudFront authentication mechanism.

INCORRECT: "Configure an allow rule in the Security Group for the IP addresses of the consumers" is incorrect. Security Groups do not apply to S3 buckets.

43. Question

A Solutions Architect needs to improve performance for a web application running on EC2 instances launched by an Auto Scaling group. The instances run behind an ELB Application Load Balancer. During heavy use periods the ASG doubles in size and analysis has shown that static content stored on the EC2 instances is being requested by users in a specific geographic location.

How can the Solutions Architect reduce the need to scale and improve the application performance?

1: Store the contents on Amazon EFS instead of the EC2 root volume

2: Implement Amazon Redshift to create a repository of the content closer to the users

3: Create an Amazon CloudFront distribution for the site and redirect user traffic to the distribution

4: Re-deploy the application in a new VPC that is closer to the users making the requests

Answer: 3

Explanation:

This is a good use case for CloudFront. CloudFront is a content delivery network (CDN) that caches content closer to users. You can cache the static content on CloudFront using the EC2 instances as origins for the content. This will improve performance (as the content is closer to the users) and reduce the need for the ASG to scale (as you don’t need the processing power of the EC2 instances to serve the static content).

CORRECT: "Create an Amazon CloudFront distribution for the site and redirect user traffic to the distribution" is the correct answer.

INCORRECT: "Store the contents on Amazon EFS instead of the EC2 root volume" is incorrect. Using EFS instead of the EC2 root volume does not solve either problem.

INCORRECT: "Implement Amazon Redshift to create a repository of the content closer to the users" is incorrect. RedShift cannot be used to create content repositories to get content closer to users, it's a data warehouse used for analytics.

INCORRECT: "Re-deploy the application in a new VPC that is closer to the users making the requests" is incorrect. Re-deploying the application in a VPC closer to the users may reduce latency (and therefore improve performance), but it doesn't solve the problem of reducing the need for the ASG to scale.

44. Question

A company needs to store data for 5 years. The company will need to have immediate and highly available access to the data at any point in time but will not require frequent access.

Which lifecycle action should be taken to meet the requirements while reducing costs?

1: Transition objects from Amazon S3 Standard to the GLACIER storage class

2: Transition objects to expire after 5 years

3: Transition objects from Amazon S3 Standard to Amazon S3 Standard-Infrequent Access (S3 Standard-IA)

4: Transition objects from Amazon S3 Standard to Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)

Answer: 3

Explanation:

This is a good use case for S3 Standard-IA which provides immediate access and 99.9% availability.

CORRECT: "Transition objects from Amazon S3 Standard to Amazon S3 Standard-Infrequent Access (S3 Standard-IA)" is the correct answer.

INCORRECT: "Transition objects from Amazon S3 Standard to the GLACIER storage class" is incorrect. The Glacier storage class does not provide immediate access. You can retrieve within hours or minutes, but you do need to submit a job to retrieve the data.

INCORRECT: "Transition objects to expire after 5 years" is incorrect. Expiring the objects after 5 years is going to delete them at the end of the 5-year period, but you still need to work out the best storage solution to use before then, and this answer does not provide a solution.

INCORRECT: "Transition objects from Amazon S3 Standard to Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)" is incorrect. The S3 One Zone-IA tier provides immediate access, but the availability is lower at 99.5% so this is not the best option.

45. Question

A retail organization is deploying a new application that will read and write data to a database. The company wants to deploy the application in three different AWS Regions in an active-active configuration. The databases need to replicate to keep information in sync.

Which solution best meets these requirements?

1: AWS Database Migration Service with change data capture

2: Amazon DynamoDB with global tables

3: Amazon Athena with Amazon S3 cross-region replication

4: Amazon Aurora Global Database

Answer: 2

Explanation:

Amazon DynamoDB global tables provide a fully managed solution for deploying a multi-region, multi-master database. This is the only solution presented that provides an active-active configuration where reads and writes can take place in multiple regions with full bi-directional synchronization.

CORRECT: "Amazon DynamoDB with global tables" is the correct answer.

INCORRECT: "AWS Database Migration Service with change data capture" is incorrect as the DMS is used for data migration from a source to a destination. However, in this example we need a multi-master database and DMS will not allow this configuration.

INCORRECT: "Amazon Athena with Amazon S3 cross-region replication" is incorrect. Amazon Athena with S3 cross-region replication is not suitable. This is not a solution that provides a transactional database solution (Athena is used for analytics), or active-active synchronization.

INCORRECT: "Amazon Aurora Global Database" is incorrect. Amazon Aurora Global Database provides read access to a database in multiple regions – it does not provide active-active configuration with bi-directional synchronization (though you can failover to your read-only DBs and promote them to writable).

46. Question

You are a Solutions Architect at Digital Cloud Training. One of your clients runs an application that writes data to a DynamoDB table. The client has asked how they can implement a function that runs code in response to item level changes that take place in the DynamoDB table. What would you suggest to the client?

1: Enable server access logging and create an event source mapping between AWS Lambda and the S3 bucket to which the logs are written

2: Enable DynamoDB Streams and create an event source mapping between AWS Lambda and the relevant stream

3: Create a local secondary index that records item level changes and write some custom code that responds to updates to the index

4: Use Kinesis Data Streams and configure DynamoDB as a producer

Answer: 2

Explanation:

DynamoDB Streams help you to keep a list of item level changes or provide a list of item level changes that have taken place in the last 24hrs. Amazon DynamoDB is integrated with AWS Lambda so that you can create triggers —pieces of code that automatically respond to events in DynamoDB Streams.

If you enable DynamoDB Streams on a table, you can associate the stream ARN with a Lambda function that you write. Immediately after an item in the table is modified, a new record appears in the table's stream. AWS Lambda polls the stream and invokes your Lambda function synchronously when it detects new stream records.

An event source mapping identifies a poll-based event source for a Lambda function. It can be either an Amazon Kinesis or DynamoDB stream. Event sources maintain the mapping configuration except for stream-based services (e.g. DynamoDB, Kinesis) for which the configuration is made on the Lambda side and Lambda performs the polling.

CORRECT: "Enable DynamoDB Streams and create an event source mapping between AWS Lambda and the relevant stream" is the correct answer.

INCORRECT: "Enable server access logging and create an event source mapping between AWS Lambda and the S3 bucket to which the logs are written" is incorrect. The questions asks for a solution that runs code in response to changes in a DynamoDB table, not an S3 bucket.

INCORRECT: "Create a local secondary index that records item level changes and write some custom code that responds to updates to the index" is incorrect. A local secondary index maintains an alternate sort key for a given partition key value, it does not record item level changes.

INCORRECT: "Use Kinesis Data Streams and configure DynamoDB as a producer" is incorrect. You cannot configure DynamoDB as a Kinesis Data Streams producer.

47. Question

A recent security audit uncovered some poor deployment and configuration practices within your VPC. You need to ensure that applications are deployed in secure configurations.

How can this be achieved in the most operationally efficient manner?

1: Remove the ability for staff to deploy applications

2: Use CloudFormation with securely configured templates

3: Manually check all application configurations before deployment

4: Use AWS Inspector to apply secure configurations

Answer: 2

Explanation:

CloudFormation helps users to deploy resources in a consistent and orderly way. By ensuring the CloudFormation templates are created and administered with the right security configurations for your resources, you

can then repeatedly deploy resources with secure settings and reduce the risk of human error.

CORRECT: "Use CloudFormation with securely configured templates" is the correct answer.

INCORRECT: "Remove the ability for staff to deploy applications" is incorrect. Removing the ability of staff to deploy resources does not help you to deploy applications securely as it does not solve the problem of how to do this in an operationally efficient manner.

INCORRECT: "Manually check all application configurations before deployment" is incorrect. Manual checking of all application configurations before deployment is not operationally efficient.

INCORRECT: "Use AWS Inspector to apply secure configurations" is incorrect. Amazon Inspector is an automated security assessment service that helps improve the security and compliance of applications ***deployed*** on AWS. It is not used to secure the actual deployment of resources, only to assess the deployed state of the resources.

48. Question

A Solutions Architect needs to transform data that is being uploaded into S3. The uploads happen sporadically and the transformation should be triggered by an event. The transformed data should then be loaded into a target data store.

What services would be used to deliver this solution in the MOST cost-effective manner? (Select TWO)

1: Configure a CloudWatch alarm to send a notification to CloudFormation when data is uploaded

2: Configure S3 event notifications to trigger a Lambda function when data is uploaded and use the Lambda function to trigger the ETL job

3: Configure CloudFormation to provision a Kinesis data stream to transform the data and load it into S3

4: Use AWS Glue to extract, transform and load the data into the target data store

5: Configure CloudFormation to provision AWS Data Pipeline to transform the data

Answer: 2,4

Explanation:

The Amazon S3 notification feature enables you to receive notifications when certain events happen in your bucket. To enable notifications, you must first add a notification configuration that identifies the events you want Amazon S3 to publish and the destinations where you want Amazon S3 to send the notifications. You store this configuration in the *notification* subresource that is associated with a bucket.

AWS Glue is a fully managed extract, transform, and load (ETL) service that makes it easy for customers to prepare and load their data for analytics.

With this solution S3 event notifications triggering a Lambda function is completely serverless and cost-effective and AWS Glue can trigger ETL jobs that will transform that data and load it into a data store such as S3.

CORRECT: "Configure S3 event notifications to trigger a Lambda function when data is uploaded and use the Lambda function to trigger the ETL job" is a correct answer.

CORRECT: "Use AWS Glue to extract, transform and load the data into the target data store" is also a correct answer.

INCORRECT: "Configure a CloudWatch alarm to send a notification to CloudFormation when data is uploaded" is incorrect. Using event notifications is the best solution.

INCORRECT: "Configure CloudFormation to provision a Kinesis data stream to transform the data and load it into S3" is incorrect. Kinesis Data Streams is used for processing data, rather than extracting and transforming it. The Kinesis consumers are EC2 instances which are not as cost-effective as serverless solutions.

INCORRECT: "Configure CloudFormation to provision AWS Data Pipeline to transform the data" is incorrect. AWS Data Pipeline can be used to automate the movement and transformation of data, it relies on other services to actually transform the data.

49. Question

An application you manage uses Auto Scaling and a fleet of EC2 instances. You recently noticed that Auto Scaling is scaling the number of instances up and down multiple times in the same hour. You need to implement a remediation to reduce the amount of scaling events. The

remediation must be cost-effective and preserve elasticity. What design changes would you implement? (Select TWO)

1: Modify the CloudWatch alarm period that triggers your Auto Scaling scale down policy

2: Modify the Auto Scaling group termination policy to terminate the newest instance first

3: Modify the Auto Scaling group termination policy to terminate the oldest instance first

4: Modify the Auto Scaling group cool-down timers

5: Modify the Auto Scaling policy to use scheduled scaling actions

Answer: 1,4

Explanation:

The cooldown period is a configurable setting for your Auto Scaling group that helps to ensure that it doesn't launch or terminate additional instances before the previous scaling activity takes effect so this would help. After the Auto Scaling group dynamically scales using a simple scaling policy, it waits for the cooldown period to complete before resuming scaling activities.

The CloudWatch Alarm Evaluation Period is the number of the most recent data points to evaluate when determining alarm state. This would help as you can increase the number of datapoints required to trigger an alarm.

CORRECT: "Modify the CloudWatch alarm period that triggers your Auto Scaling scale down policy" is the correct answer.

CORRECT: "Modify the Auto Scaling group cool-down timers" is the correct answer.

INCORRECT: "Modify the Auto Scaling group termination policy to terminate the newest instance first" is incorrect. The order in which Auto Scaling terminates instances is not the issue here, the problem is that the workload is dynamic and Auto Scaling is constantly reacting to change, and launching or terminating instances.

INCORRECT: "Modify the Auto Scaling group termination policy to terminate the oldest instance first" is incorrect. As per the previous explanation, the order of termination is not the issue here.

INCORRECT: "Modify the Auto Scaling policy to use scheduled scaling actions" is incorrect. Using scheduled scaling actions may not be cost-effective and also affects elasticity as it is less dynamic.

50. Question

An application runs on two EC2 instances in private subnets split between two AZs. The application needs to connect to a CRM SaaS application running on the Internet. The vendor of the SaaS application restricts authentication to a whitelist of source IP addresses and only 2 IP addresses can be configured per customer.

What is the most appropriate and cost-effective solution to enable authentication to the SaaS application?

1: Use a Network Load Balancer and configure a static IP for each AZ

2: Use multiple Internet-facing Application Load Balancers with Elastic IP addresses

3: Configure redundant Internet Gateways and update the routing tables for each subnet

4: Configure a NAT Gateway for each AZ with an Elastic IP address

Answer: 4

Explanation:

In this scenario you need to connect the EC2 instances to the SaaS application with a source address of one of two whitelisted public IP addresses to ensure authentication works.

A NAT Gateway is created in a specific AZ and can have a single Elastic IP address associated with it. NAT Gateways are deployed in public subnets and the route tables of the private subnets where the EC2 instances reside are configured to forward Internet-bound traffic to the NAT Gateway. You do pay for using a NAT Gateway based on hourly usage and data processing, however this is still a cost-effective solution.

CORRECT: "Configure a NAT Gateway for each AZ with an Elastic IP address" is the correct answer.

INCORRECT: "Use a Network Load Balancer and configure a static IP for each AZ" is incorrect. A Network Load Balancer can be configured with a single static IP address (the other types of ELB cannot) for each AZ. However, using a NLB is not an appropriate solution as the connections are being made outbound from the EC2 instances to the SaaS app and ELBs are used for distributing inbound connection requests to EC2 instances (only return traffic goes back through the ELB).

INCORRECT: "Use multiple Internet-facing Application Load Balancers with Elastic IP addresses" is incorrect. An ALB does not support static IP addresses and is not suitable for a proxy function.

INCORRECT: "Configure redundant Internet Gateways and update the routing tables for each subnet" is incorrect as you cannot create multiple Internet Gateways. An IGW is already redundant.

51. Question

An application tier of a multi-tier web application currently hosts two web services on the same set of instances. The web services each listen for traffic on different ports. Which AWS service should a Solutions Architect use to route traffic to the service based on the incoming request path?

1: Amazon Route 53

2: Amazon CloudFront

3: Application Load Balancer (ALB)

4: Classic Load Balancer (CLB)

Answer: 3

Explanation:

An Application Load Balancer is a type of Elastic Load Balancer that can use layer 7 (HTTP/HTTPS) protocol data to make forwarding decisions. An ALB supports both path-based (e.g. /images or /orders) and host-based routing (e.g. example.com).

In this scenario a single EC2 instance is listening for traffic for each application on a different port. You can use a target group that listens on a single port (HTTP or HTTPS) and then uses listener rules to selectively route to a different port on the EC2 instance based on the information in the URL path. So you might have example.com/images going to one backend port and example.com/orders going to a different backend port.

CORRECT: "Application Load Balancer (ALB)" is the correct answer.

INCORRECT: "Amazon Route 53" is incorrect. Amazon Route 53 is a DNS service. It can be used to load balance however it does not have the ability to route based on information in the incoming request path.

INCORRECT: "Amazon CloudFront" is incorrect. Amazon CloudFront is used for caching content. It can route based on request path to custom

origins however the question is not requesting a content caching service so it's not the best fit for this use case.

INCORRECT: "Classic Load Balancer (CLB)" is incorrect. You cannot use host-based or path-based routing with a CLB.

52. Question

The data scientists in your company are looking for a service that can process and analyze real-time, streaming data. They would like to use standard SQL queries to query the streaming data.

Which combination of AWS services would deliver these requirements?

1: DynamoDB and EMR

2: Kinesis Data Streams and Kinesis Data Analytics

3: ElastiCache and EMR

4: Kinesis Data Streams and Kinesis Firehose

Answer: 2

Explanation:

Kinesis Data Streams enables you to build custom applications that process or analyze streaming data for specialized needs.

Amazon Kinesis Data Analytics is the easiest way to process and analyze real-time, streaming data. Kinesis Data Analytics can use standard SQL queries to process Kinesis data streams and can ingest data from Kinesis Streams and Kinesis Firehose.

CORRECT: "Kinesis Data Streams and Kinesis Data Analytics" is the correct answer.

INCORRECT: "DynamoDB and EMR" is incorrect. DynamoDB is a NoSQL database that can be used for storing data from a stream but cannot be used to process or analyze the data or to query it with SQL queries. Elastic Map Reduce (EMR) is a hosted Hadoop framework and is not used for analytics on streaming data.

INCORRECT: "ElastiCache and EMR" is incorrect as ElastiCache is an in-memory database cache service, it is not used for streaming data. Elastic Map Reduce (EMR) is a hosted Hadoop framework and is not used for analytics on streaming data.

INCORRECT: "Kinesis Data Streams and Kinesis Firehose" is incorrect. Firehose cannot be used for running SQL queries.

53. Question

An e-commerce application is hosted in AWS. The last time a new product was launched, the application experienced a performance issue due to an enormous spike in traffic. Management decided that capacity must be doubled this week after the product is launched.

What is the MOST efficient way for management to ensure that capacity requirements are met?

1: Add a Step Scaling policy

2: Add a Simple Scaling policy

3: Add a Scheduled Scaling action

4: Add Amazon EC2 Spot instances

Answer: 3

Explanation:

Scaling based on a schedule allows you to set your own scaling schedule for predictable load changes. To configure your Auto Scaling group to scale based on a schedule, you create a scheduled action. This is ideal for situations where you know when and for how long you are going to need the additional capacity.

CORRECT: "Add a Scheduled Scaling action" is the correct answer.

INCORRECT: "Add a Step Scaling policy" is incorrect. Step scaling policies increase or decrease the current capacity of your Auto Scaling group based on a set of scaling adjustments, known as step adjustments. The adjustments vary based on the size of the alarm breach. This is more suitable to situations where the load unpredictable.

INCORRECT: "Add a Simple Scaling policy" is incorrect. AWS recommend using step over simple scaling in most cases. With simple scaling, after a scaling activity is started, the policy must wait for the scaling activity or health check replacement to complete and the cooldown period to expire before responding to additional alarms (in contrast to step scaling). Again, this is more suitable to unpredictable workloads.

INCORRECT: "Add Amazon EC2 Spot instances" is incorrect. Adding spot instances may decrease EC2 costs but you still need to ensure they are

available. The main requirement of the question is that the performance issues are resolved rather than the cost being minimized.

54. Question

You need to configure an application to retain information about each user session and have decided to implement a layer within the application architecture to store this information.

Which of the options below could be used? (Select TWO)

1: Sticky sessions on an Elastic Load Balancer (ELB)

2: A block storage service such as Elastic Block Store (EBS)

3: A workflow service such as Amazon Simple Workflow Service (SWF)

4: A relational data store such as Amazon RDS

5: A key/value store such as ElastiCache Redis

Answer: 1,5

Explanation:

In order to address scalability and to provide a shared data storage for sessions that can be accessible from any individual web server, you can abstract the HTTP sessions from the web servers themselves. A common solution to for this is to leverage an In-Memory Key/Value store such as Redis and Memcached.

Sticky sessions, also known as session affinity, allow you to route a site user to the particular web server that is managing that individual user's session. The session's validity can be determined by a number of methods, including a client-side cookie or via configurable duration parameters that can be set at the load balancer which routes requests to the web servers. You can configure sticky sessions on Amazon ELBs.

CORRECT: "Sticky sessions on an Elastic Load Balancer (ELB)" is the correct answer.

CORRECT: "A key/value store such as ElastiCache Redis" is the correct answer.

INCORRECT: "A block storage service such as Elastic Block Store (EBS)" is incorrect. In this instance the question states that a caching layer is being implemented and EBS volumes would not be suitable for creating an independent caching layer as they must be attached to EC2 instances.

INCORRECT: "A workflow service such as Amazon Simple Workflow Service (SWF)" is incorrect. Workflow services such as SWF are used for carrying out a series of tasks in a coordinated task flow. They are not suitable for storing session state data.

INCORRECT: "A relational data store such as Amazon RDS" is incorrect. Relational databases are not typically used for storing session state data due to their rigid schema that tightly controls the format in which data can be stored.

55. Question

An application running on an external website is attempting to initiate a request to your company's website using API calls to Amazon API Gateway. A problem has been reported in which the requests are failing with an error that includes the following text:

"Cross-Origin Request Blocked: The Same Origin Policy disallows reading the remote resource"

You have been asked to resolve the problem, what is the most likely solution?

1: The IAM policy does not allow access to the API

2: The ACL on the API needs to be updated

3: The request is not secured with SSL/TLS

4: Enable CORS on the APIs resources using the selected methods under the API Gateway

Answer: 4

Explanation:

Cross-origin resource sharing (CORS) is a browser security feature that restricts cross-origin HTTP requests that are initiated from scripts running in the browser. If your REST API's resources receive non-simple cross-origin HTTP requests, you need to enable CORS support.

A *cross-origin* HTTP request is one that is made to:

- A different *domain* (for example, from example.com to amazondomains.com)
- A different *subdomain* (for example, from example.com to petstore.example.com)

- A different *port* (for example, from example.com to example.com:10777)
- A different *protocol* (for example, from https://example.com to http://example.com)

To support CORS, therefore, a REST API resource needs to implement an OPTIONS method that can respond to the OPTIONS preflight request with at least the following response headers mandated by the Fetch standard:

- Access-Control-Allow-Methods
- Access-Control-Allow-Headers
- Access-Control-Allow-Origin

CORRECT: "Enable CORS on the APIs resources using the selected methods under the API Gateway" is the correct answer.

INCORRECT: "The IAM policy does not allow access to the API" is incorrect. IAM policies are not used to control CORS and there is no ACL on the API to update.

INCORRECT: "The ACL on the API needs to be updated" is incorrect. There is no ACL on an API.

INCORRECT: "The request is not secured with SSL/TLS" is incorrect. This error would display whether using SSL/TLS or not.

56. Question

A solutions Architect is designing a new workload where an AWS Lambda function will access an Amazon DynamoDB table.

What is the MOST secure means of granting the Lambda function access to the DynamoDB table?

1: Create an identity and access management (IAM) role with the necessary permissions to access the DynamoDB table, and assign the role to the Lambda function

2: Create a DynamoDB username and password and give them to the Developer to use in the Lambda function

3: Create an identity and access management (IAM) user and create access and secret keys for the user. Give the user the necessary permissions to access the DynamoDB table. Have the Developer use these keys to access the resources

4: Create an identity and access management (IAM) role allowing access from AWS Lambda and assign the role to the DynamoDB table

Answer: 1

Explanation:

The most secure method is to use an IAM role so you don't need to embed any credentials in code and can tightly control the services that your Lambda function can access. You need to assign the role to the Lambda function, NOT to the DynamoDB table.

CORRECT: "Create an identity and access management (IAM) role with the necessary permissions to access the DynamoDB table, and assign the role to the Lambda function" is the correct answer.

INCORRECT: "Create a DynamoDB username and password and give them to the Developer to use in the Lambda function" is incorrect. You cannot create a user name and password for DynamoDB and it would be bad practice to store these in the function code if you could.

INCORRECT: "Create an identity and access management (IAM) user and create access and secret keys for the user. Give the user the necessary permissions to access the DynamoDB table. Have the Developer use these keys to access the resources" is incorrect. You should not use an access key and secret ID to access DynamoDB. Again, this means embedding credentials in code which should be avoided.

INCORRECT: "Create an identity and access management (IAM) role allowing access from AWS Lambda and assign the role to the DynamoDB table" is incorrect as the role should be assigned to the Lambda function so it can access the table.

57. Question

You are a Solutions Architect at a media company and you need to build an application stack that can receive customer comments from sporting events. The application is expected to receive significant load that could scale to millions of messages within a short space of time following high-profile matches. As you are unsure of the load required for the database layer what is the most cost-effective way to ensure that the messages are not dropped?

1: Use DynamoDB and provision enough write capacity to handle the highest expected load

2: Write the data to an S3 bucket, configure RDS to poll the bucket for new messages

3: Create an SQS queue and modify the application to write to the SQS queue. Launch another application instance the polls the queue and writes messages to the database

4: Use RDS Auto Scaling for the database layer which will automatically scale as required

Answer: 3

Explanation:

Amazon Simple Queue Service (Amazon SQS) is a web service that gives you access to message queues that store messages waiting to be processed. SQS offers a reliable, highly-scalable, hosted queue for storing messages in transit between computers and is used for distributed/decoupled applications.

CORRECT: "Create an SQS queue and modify the application to write to the SQS queue. Launch another application instance the polls the queue and writes messages to the database" is the correct answer.

INCORRECT: "Use DynamoDB and provision enough write capacity to handle the highest expected load" is incorrect. With DynamoDB there are 2 pricing options:

– Provisioned capacity has been around forever and is one of the incorrect answers to this question. With provisioned capacity you have to specify the number of read/write capacity units to provision and pay for these regardless of the load on the database.

– With the On-demand capacity mode DynamoDB is charged based on the data reads and writes your application performs on your tables. You do not need to specify how much read and write throughput you expect your application to perform because DynamoDB instantly accommodates your workloads as they ramp up or down. it might be a good solution to this question but is not an available option.

INCORRECT: "Write the data to an S3 bucket, configure RDS to poll the bucket for new messages" is incorrect.

INCORRECT: "Use RDS Auto Scaling for the database layer which will automatically scale as required" is incorrect. RDS Auto Scaling does not exist. With RDS you have to select the underlying EC2 instance type to use and pay for that regardless of the actual load on the DB. Note that a new

feature released in June 2019 does allow Auto Scaling for the RDS storage, but not the compute layer.

58. Question

An organization in the health industry needs to create an application that will transmit protected health data to thousands of service consumers in different AWS accounts. The application servers run on EC2 instances in private VPC subnets. The routing for the application must be fault tolerant.

What should be done to meet these requirements?

1: Create a virtual private gateway connection between each pair of service provider VPCs and service consumer VPCs

2: Create a proxy server in the service provider VPC to route requests from service consumers to the application servers

3: Create a VPC endpoint service and grant permissions to specific service consumers to create a connection

4: Create an internal Application Load Balancer in the service provider VPC and put application servers behind it

Answer: 3

Explanation:

What you need to do here is offer the service through a service provider offering. This is a great use case for a VPC endpoint service using AWS PrivateLink (referred to as an endpoint service). Other AWS principals can then create a connection from their VPC to your endpoint service using an interface VPC endpoint.

You are acting as the service provider and offering the service to service consumers. This configuration uses a Network Load Balancer and can be fault tolerant by configuring multiple subnets in which the EC2 instances are running.

CORRECT: "Create a VPC endpoint service and grant permissions to specific service consumers to create a connection" is the correct answer.

INCORRECT: "Create a virtual private gateway connection between each pair of service provider VPCs and service consumer VPCs" is incorrect. Creating a virtual private gateway connection between each pair of service

provider VPCs and service consumer VPCs would be extremely cumbersome and is not the best option.

INCORRECT: "Create a proxy server in the service provider VPC to route requests from service consumers to the application servers" is incorrect. Using a proxy service is possible but would not scale as well and would present a single point of failure unless there is some load balancing to multiple proxies (not mentioned).

INCORRECT: "Create an internal Application Load Balancer in the service provider VPC and put application servers behind it" is incorrect. Creating an internal ALB would not work as you need consumers from outside your VPC to be able to connect.

59. Question

A Solutions Architect is developing an encryption solution. The solution requires that data keys are encrypted using envelope protection before they are written to disk.

Which solution option can assist with this requirement?

1: API Gateway with STS

2: IAM Access Key

3: AWS Certificate Manager

4: AWS KMS API

Answer: 4

Explanation:

When you encrypt your data, your data is protected, but you have to protect your encryption key. One strategy is to encrypt it. *Envelope encryption* is the practice of encrypting plaintext data with a data key, and then encrypting the data key under another key.

Envelope encryption offers several benefits:

- **Protecting data keys**

When you encrypt a data key, you don't have to worry about storing the encrypted data key, because the data key is inherently protected by encryption. You can safely store the encrypted data key alongside the encrypted data.

- **Encrypting the same data under multiple master keys**

Encryption operations can be time consuming, particularly when the data being encrypted are large objects. Instead of re-encrypting raw data multiple times with different keys, you can re-encrypt only the data keys that protect the raw data.

- **Combining the strengths of multiple algorithms**

In general, symmetric key algorithms are faster and produce smaller ciphertexts than public key algorithms. But public key algorithms provide inherent separation of roles and easier key management. Envelope encryption lets you combine the strengths of each strategy.

CORRECT: "AWS KMS API" is the correct answer.

INCORRECT: "API Gateway with STS" is incorrect. The AWS Security Token Service (STS) is a web service that enables you to request temporary, limited-privilege credentials for AWS Identity and Access Management (IAM) users or for users that you authenticate (federated users).

INCORRECT: "IAM Access Key" is incorrect. IAM access keys are used for signing programmatic requests you make to AWS.

INCORRECT: "AWS Certificate Manager" is incorrect. AWS Certificate Manager is a service that lets you easily provision, manage, and deploy public and private Secure Sockets Layer/Transport Layer Security (SSL/TLS) certificates for use with AWS services and your internal connected resources.

60. Question

A research company is developing a data lake solution in Amazon S3 to analyze huge datasets. The solution makes infrequent SQL queries only. In addition, the company wants to minimize infrastructure costs.

Which AWS service should be used to meet these requirements?

1: Amazon Aurora

2: Amazon RDS for MySQL

3: Amazon Athena

4: Amazon Redshift Spectrum

Answer: 3

Explanation:

Amazon Athena is an interactive query service that makes it easy to analyze data in Amazon S3 using standard SQL. Athena is serverless, so there is no infrastructure to manage, and you pay only for the queries that you run – this satisfies the requirement to minimize infrastructure costs for infrequent queries.

CORRECT: "Amazon Athena" is the correct answer.

INCORRECT: "Amazon Aurora" is incorrect. Amazon RDS and Aurora are not suitable solutions for analyzing datasets on S3 – these are both relational databases typically used for transactional (not analytical) workloads.

INCORRECT: "Amazon RDS for MySQL" is incorrect as per the previous explanation.

INCORRECT: "Amazon Redshift Spectrum" is incorrect. Amazon RedShift Spectrum is a feature of Amazon Redshift that enables you to run queries against exabytes of unstructured data in Amazon S3, with no loading or ETL required. However, RedShift nodes run on EC2 instances, so for infrequent queries this will not minimize infrastructure costs.

61. Question

Your company shares some HR videos stored in an Amazon S3 bucket via CloudFront. You need to restrict access to the private content so users coming from specific IP addresses can access the videos and ensure direct access via the Amazon S3 bucket is not possible.

How can this be achieved?

1: Configure CloudFront to require users to access the files using signed cookies, create an origin access identity (OAI) and instruct users to login with the OAI

2: Configure CloudFront to require users to access the files using a signed URL, create an origin access identity (OAI) and restrict access to the files in the Amazon S3 bucket to the OAI

3: Configure CloudFront to require users to access the files using signed cookies, and move the files to an encrypted EBS volume

4: Configure CloudFront to require users to access the files using a signed URL, and configure the S3 bucket as a website endpoint

Answer: 2

Explanation:

A signed URL includes additional information, for example, an expiration date and time, that gives you more control over access to your content. You can also specify the IP address or range of IP addresses of the users who can access your content.

If you use CloudFront signed URLs (or signed cookies) to limit access to files in your Amazon S3 bucket, you may also want to prevent users from directly accessing your S3 files by using Amazon S3 URLs. To achieve this you can create an origin access identity (OAI), which is a special CloudFront user, and associate the OAI with your distribution.

You can then change the permissions either on your Amazon S3 bucket or on the files in your bucket so that only the origin access identity has read permission (or read and download permission).

CORRECT: "Configure CloudFront to require users to access the files using a signed URL, create an origin access identity (OAI) and restrict access to the files in the Amazon S3 bucket to the OAI" is the correct answer.

INCORRECT: "Configure CloudFront to require users to access the files using signed cookies, create an origin access identity (OAI) and instruct users to login with the OAI" is incorrect. Users cannot login with an OAI.

INCORRECT: "Configure CloudFront to require users to access the files using signed cookies, and move the files to an encrypted EBS volume" is incorrect. You cannot use CloudFront and an OAI when your S3 bucket is configured as a website endpoint.

INCORRECT: "Configure CloudFront to require users to access the files using a signed URL, and configure the S3 bucket as a website endpoint" is incorrect. You cannot use CloudFront to pull data directly from an EBS volume.

62. Question

The company you work for is currently transitioning their infrastructure and applications into the AWS cloud. You are planning to deploy an Elastic Load Balancer (ELB) that distributes traffic for a web application running on EC2 instances. You still have some application servers running on-premise and you would like to distribute application traffic across both your AWS and on-premises resources.

How can this be achieved?

1: Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use IP based targets for both your EC2 instances and on-premises servers

2: Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use Instance ID based targets for both your EC2 instances and on-premises servers

3: Provision an IPSec VPN connection between your on-premises location and AWS and create a CLB that uses cross-zone load balancing to distributed traffic across EC2 instances and on-premises servers

4: This cannot be done, ELBs are an AWS service and can only distribute traffic within the AWS cloud

Answer: 1

Explanation:

The ALB (and NLB) supports IP addresses as targets as well as instance IDs as targets. When you create a target group, you specify its target type, which determines how you specify its targets. After you create a target group, you cannot change its target type.

Using IP addresses as targets allows load balancing any application hosted in AWS or on-premises using IP addresses of the application back-ends as targets.

You must have a VPN or Direct Connect connection to enable this configuration to work.

CORRECT: "Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use IP based targets for both your EC2 instances and on-premises servers" is the correct answer.

INCORRECT: "Provision a Direct Connect connection between your on-premises location and AWS and create a target group on an ALB to use Instance ID based targets for both your EC2 instances and on-premises servers" is incorrect. You cannot use instance ID based targets for on-premises servers and you cannot mix instance ID and IP address target types in a single target group.

INCORRECT: "Provision an IPSec VPN connection between your on-premises location and AWS and create a CLB that uses cross-zone load

balancing to distributed traffic across EC2 instances and on-premises servers" is incorrect. The CLB does not support IP addresses as targets.

INCORRECT: "This cannot be done, ELBs are an AWS service and can only distribute traffic within the AWS cloud" is incorrect as this statement is incorrect.

63. Question

An application you are designing receives and processes files. The files are typically around 4GB in size and the application extracts metadata from the files which typically takes a few seconds for each file. The pattern of updates is highly dynamic with times of little activity and then multiple uploads within a short period of time.

What architecture will address this workload the most cost efficiently?

1: Use a Kinesis data stream to store the file, and use Lambda for processing

2: Store the file in an EBS volume which can then be accessed by another EC2 instance for processing

3: Upload files into an S3 bucket, and use the Amazon S3 event notification to invoke a Lambda function to extract the metadata

4: Place the files in an SQS queue, and use a fleet of EC2 instances to extract the metadata

Answer: 3

Explanation:

Storing the file in an S3 bucket is the most cost-efficient solution, and using S3 event notifications to invoke a Lambda function works well for this unpredictable workload.

CORRECT: "Upload files into an S3 bucket, and use the Amazon S3 event notification to invoke a Lambda function to extract the metadata" is the correct answer.

INCORRECT: "Use a Kinesis data stream to store the file, and use Lambda for processing" is incorrect. Kinesis data streams runs on EC2 instances and you must therefore provision some capacity even when the application is not receiving files. This is not as cost-efficient as storing them in an S3 bucket prior to using Lambda for the processing.

INCORRECT: "Store the file in an EBS volume which can then be accessed by another EC2 instance for processing" is incorrect. Storing the

file in an EBS volume and using EC2 instances for processing is not cost efficient.

INCORRECT: "Place the files in an SQS queue, and use a fleet of EC2 instances to extract the metadata" is incorrect. SQS queues have a maximum message size of 256KB. You can use the extended client library for Java to use pointers to a payload on S3 but the maximum payload size is 2GB.

64. Question

The website for a new application received around 50,000 requests each second and the company wants to use multiple applications to analyze the navigation patterns of the users on their website so they can personalize the user experience.

What can a Solutions Architect use to collect page clicks for the website and process them sequentially for each user?

1: Amazon Kinesis Data Streams

2: Amazon SQS FIFO queue

3: AWS CloudTrail trail

4: Amazon SQS standard queue

Answer: 1

Explanation:

This is a good use case for Amazon Kinesis streams as it is able to scale to the required load, allow multiple applications to access the records and process them sequentially.

Amazon Kinesis Data Streams enables real-time processing of streaming big data. It provides ordering of records, as well as the ability to read and/or replay records in the same order to multiple Amazon Kinesis Applications.

Amazon Kinesis streams allows up to 1 MiB of data per second or 1,000 records per second for writes per shard. There is no limit on the number of shards so you can easily scale Kinesis Streams to accept 50,000 per second.

The Amazon Kinesis Client Library (KCL) delivers all records for a given partition key to the same record processor, making it easier to build multiple applications reading from the same Amazon Kinesis data stream.

CORRECT: "Amazon Kinesis Streams" is the correct answer.

INCORRECT: "Amazon SQS FIFO queue" is incorrect as SQS is not best suited to streaming data and Kinesis is a better solution.

INCORRECT: "AWS CloudTrail trail" is incorrect. CloudTrail is used for auditing and is not useful here.

INCORRECT: "Amazon SQS standard queue" is incorrect. Standard SQS queues do not ensure that messages are processed sequentially and FIFO SQS queues do not scale to the required number of transactions a second.

65. Question

You are building an application that will collect information about user behavior. The application will rapidly ingest large amounts of dynamic data and requires very low latency. The database must be scalable without incurring downtime. Which database would you recommend for this scenario?

1: RDS with MySQL

2: DynamoDB

3: RedShift

4: RDS with Microsoft SQL

Answer: 2

Explanation:

Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability. Push button scaling means that you can scale the DB at any time without incurring downtime. DynamoDB provides low read and write latency.

CORRECT: "DynamoDB" is the correct answer.

INCORRECT: "RDS with MySQL" is incorrect. RDS uses EC2 instances so you have to change your instance type/size in order to scale compute vertically.

INCORRECT: "RedShift" is incorrect. RedShift uses EC2 instances as well, so you need to choose your instance type/size for scaling compute vertically, but you can also scale horizontally by adding more nodes to the cluster.

INCORRECT: "RDS with Microsoft SQL" is incorrect. Rapid ingestion of dynamic data is not an ideal use case for RDS or RedShift.

SET 2: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 2: Practice Questions, Answers & Explanations

1. Question

A development team needs to host a website that will be accessed by other teams. The website contents consist of HTML, CSS, client-side JavaScript, and images. A Solutions Architect has been asked to recommend a solution for hosting the website.

Which solution is the MOST cost-effective?

1: Containerize the website and host it in AWS Fargate

2: Create an Amazon S3 bucket and host the website there

3: Deploy a web server on an Amazon EC2 instance to host the website

4: Configure an Application Load Balancer with an AWS Lambda target

2. Question

A company requires a solution to allow customers to customize images that are stored in an online catalog. The image customization parameters will be sent in requests to Amazon API Gateway. The customized image will then be generated on-demand and can be accessed online.

The solutions architect requires a highly available solution. Which solution will be MOST cost-effective?

1: Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original and manipulated images in Amazon S3. Configure an Elastic Load Balancer in front of the EC2 instances

2: Use AWS Lambda to manipulate the original images to the requested customization. Store the original and manipulated images in Amazon S3. Configure an Amazon CloudFront distribution with the S3 bucket as the origin

3: Use AWS Lambda to manipulate the original images to the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Elastic Load Balancer in front of the Amazon EC2 instances

4: Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Amazon CloudFront distribution with the S3 bucket as the origin

3. Question

A solutions architect is finalizing the architecture for a distributed database that will run across multiple Amazon EC2 instances. Data will be replicated across all instances so the loss of an instance will not cause loss of data. The database requires block storage with low latency and throughput that supports up to several million transactions per second per server.

Which storage solution should the solutions architect use?

1: Amazon EBS

2: Amazon EC2 instance store

3: Amazon EFS

4: Amazon S3

4. Question

A website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The website's DNS records are hosted in Amazon Route 53 with the domain name pointing to the ALB. A solution is required for displaying a static error page if the website becomes unavailable.

Which configuration should a solutions architect use to meet these requirements with the LEAST operational overhead?

1: Create a Route 53 alias record for an Amazon CloudFront distribution and specify the ALB as the origin. Create custom error pages for the distribution

2: Create a Route 53 active-passive failover configuration. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the static website as the passive record for failover

3: Create a Route 53 weighted routing policy. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the record for the S3 static website with a weighting of zero. When an issue occurs increase the weighting

4: Set up a Route 53 active-active configuration with the ALB and an Amazon EC2 instance hosting a static error page as endpoints. Route 53 will only send requests to the instance if the health checks fail for the ALB

5. Question

A company is deploying a new web application that will run on Amazon EC2 instances in an Auto Scaling group across multiple Availability Zones. The application requires a shared storage solution that offers strong consistency as the content will be regularly updated.

Which solution requires the LEAST amount of effort?

1: Create an Amazon S3 bucket to store the web content and use Amazon CloudFront to deliver the content

2: Create an Amazon Elastic File System (Amazon EFS) file system and mount it on the individual Amazon EC2 instances

3: Create a shared Amazon Block Store (Amazon EBS) volume and mount it on the individual Amazon EC2 instances

4: Create a volume gateway using AWS Storage Gateway to host the data and mount it to the Auto Scaling group

6. Question

A website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The website has a mix of dynamic and static content. Customers around the world are reporting performance issues with the website.

Which set of actions will improve website performance for users worldwide?

1: Create an Amazon CloudFront distribution and configure the ALB as an origin. Then update the Amazon Route 53 record to point to the CloudFront distribution

2: Create a latency-based Amazon Route 53 record for the ALB. Then launch new EC2 instances with larger instance sizes and register the instances with the ALB

3: Launch new EC2 instances hosting the same web application in different Regions closer to the users. Use an AWS Transit Gateway to connect customers to the closest region

4: Migrate the website to an Amazon S3 bucket in the Regions closest to the users. Then create an Amazon Route 53 geolocation record to point to the S3 buckets

7. Question

A web application has recently been launched on AWS. The architecture includes two tier with a web layer and a database later. It has been identified that the web server layer may be vulnerable to cross-site scripting (XSS) attacks.

What should a solutions architect do to remediate the vulnerability?

1: Create a Classic Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

2: Create a Network Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

3: Create an Application Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

4: Create an Application Load Balancer. Put the web layer behind the load balancer and use AWS Shield Standard

8. Question

A static website currently runs in a company's on-premises data center. The company plan to migrate the website to AWS. The website must load quickly for global users and the solution must also be cost-effective.

What should a solutions architect do to accomplish this?

1: Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Replicate the S3 bucket to multiple AWS Regions

2: Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Configure Amazon CloudFront with the S3 bucket as the origin

3: Copy the website content to an Amazon EC2 instance. Configure Amazon Route 53 geolocation routing policies to select the closest origin

4: Copy the website content to multiple Amazon EC2 instances in multiple AWS Regions. Configure AWS Route 53 geolocation routing policies to select the closest region

9. Question

A multi-tier application runs with eight front-end web servers in an Amazon EC2 Auto Scaling group in a single Availability Zone behind an Application Load Balancer. A solutions architect needs to modify the infrastructure to be highly available without modifying the application.

Which architecture should the solutions architect choose that provides high availability?

1: Create an Auto Scaling group that uses four instances across each of two Regions

2: Modify the Auto Scaling group to use four instances across each of two Availability Zones

3: Create an Auto Scaling template that can be used to quickly create more instances in another Region

4: Create an Auto Scaling group that uses four instances across each of two subnets

10. Question

A company's web application is using multiple Amazon EC2 Linux instances and storing data on Amazon EBS volumes. The company is looking for a solution to increase the resiliency of the application in case of a failure. What should a solutions architect do to meet these requirements?

1: Launch the application on EC2 instances in each Availability Zone. Attach EBS volumes to each EC2 instance

2: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Mount an instance store on each EC2 instance

3: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data on Amazon EFS and mount a target on each instance

4: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data using Amazon S3 One Zone-Infrequent Access (S3 One Zone-A)

11. Question

A website runs on a Microsoft Windows server in an on-premises data center. The web server is being migrated to Amazon EC2 Windows instances in multiple Availability Zones on AWS. The web server currently uses data stored in an on-premises network-attached storage (NAS) device.

Which replacement to the NAS file share is MOST resilient and durable?

1: Migrate the file share to Amazon EBS
2: Migrate the file share to AWS Storage Gateway
3: Migrate the file share to Amazon FSx for Windows File Server
4: Migrate the file share to Amazon Elastic File System (Amazon EFS)

12. Question

A company is planning a migration for a high performance computing (HPC) application and associated data from an on-premises data center to the AWS Cloud. The company uses tiered storage on premises with hot high-performance parallel storage to support the application during periodic runs of the application, and more economical cold storage to hold the data when the application is not actively running.

Which combination of solutions should a solutions architect recommend to support the storage needs of the application? (Select TWO)

1: Amazon S3 for cold data storage
2: Amazon EFS for cold data storage
3: Amazon S3 for high-performance parallel storage
4: Amazon FSx for Lustre for high-performance parallel storage
5: Amazon FSx for Windows for high-performance parallel storage

13. Question

A web application that allows users to upload and share documents is running on a single Amazon EC2 instance with an Amazon EBS volume. To increase availability the architecture has been updated to use an Auto Scaling group of several instances across Availability Zones

behind an Application Load Balancer. After the change users can only see a subset of the documents.

What is the BEST method for a solutions architect to modify the solution so users can see all documents?

1: Run a script to synchronize the data between Amazon EBS volumes

2: Use Sticky Sessions with the ALB to ensure users are directed to the same EC2 instance in a session

3: Copy the data from all EBS volumes to Amazon EFS. Modify the application to save new documents to Amazon EFS

4: Configure the Application Load Balancer to send the request to all servers. Return each document from the correct server

14. Question

A company runs an internal browser-based application. The application runs on Amazon EC2 instances behind an Application Load Balancer. The instances run in an Amazon EC2 Auto Scaling group across multiple Availability Zones. The Auto Scaling group scales up to 20 instances during work hours, but scales down to 2 instances overnight. Staff are complaining that the application is very slow when the day begins, although it runs well by midmorning.

How should the scaling be changed to address the staff complaints and keep costs to a minimum?

1: Implement a scheduled action that sets the desired capacity to 20 shortly before the office opens

2: Implement a step scaling action triggered at a lower CPU threshold, and decrease the cooldown period

3: Implement a target tracking action triggered at a lower CPU threshold, and decrease the cooldown period

4: Implement a scheduled action that sets the minimum and maximum capacity to 20 shortly before the office opens

15. Question

An application uses Amazon EC2 instances and an Amazon RDS MySQL database. The database is not currently encrypted. A solutions architect needs to apply encryption to the database for all new and existing data. How should this be accomplished?

1: Create an Amazon ElastiCache cluster and encrypt data using the cache nodes

2: Enable encryption for the database using the API. Take a full snapshot of the database. Delete old snapshots

3: Take a snapshot of the RDS instance. Create an encrypted copy of the snapshot. Restore the RDS instance from the encrypted snapshot

4: Create an RDS read replica with encryption at rest enabled. Promote the read replica to master and switch the application over to the new master. Delete the old RDS instance

16. Question

A company have 500 TB of data in an on-premises file share that needs to be moved to Amazon S3 Glacier. The migration must not saturate the company's low-bandwidth internet connection and the migration must be completed within a few weeks.

What is the MOST cost-effective solution?

1: Create an AWS Direct Connect connection and migrate the data straight into Amazon Glacier

2: Order 7 AWS Snowball appliances and select an S3 Glacier vault as the destination. Create a bucket policy to enforce a VPC endpoint

3: Use AWS Global Accelerator to accelerate upload and optimize usage of the available bandwidth

4: Order 7 AWS Snowball appliances and select an Amazon S3 bucket as the destination. Create a lifecycle policy to transition the S3 objects to Amazon S3 Glacier

17. Question

A company has refactored a legacy application to run as two microservices using Amazon ECS. The application processes data in two parts and the second part of the process takes longer than the first.

How can a solutions architect integrate the microservices and allow them to scale independently?

1: Implement code in microservice 1 to send data to an Amazon S3 bucket. Use S3 event notifications to invoke microservice 2

2: Implement code in microservice 1 to publish data to an Amazon SNS topic. Implement code in microservice 2 to subscribe to this topic

3: Implement code in microservice 1 to send data to Amazon Kinesis Data Firehose. Implement code in microservice 2 to read from Kinesis Data Firehose

4: Implement code in microservice 1 to send data to an Amazon SQS queue. Implement code in microservice 2 to process messages from the queue

18. Question

A solutions architect is designing a two-tier web application. The application consists of a public-facing web tier hosted on Amazon EC2 in public subnets. The database tier consists of Microsoft SQL Server running on Amazon EC2 in a private subnet. Security is a high priority for the company.

How should security groups be configured in this situation? (Select TWO)

1: Configure the security group for the web tier to allow inbound traffic on port 443 from 0.0.0.0/0

2: Configure the security group for the web tier to allow outbound traffic on port 443 from 0.0.0.0/0

3: Configure the security group for the database tier to allow inbound traffic on port 1433 from the security group for the web tier

4: Configure the security group for the database tier to allow outbound traffic on ports 443 and 1433 to the security group for the web tier

5: Configure the security group for the database tier to allow inbound traffic on ports 443 and 1433 from the security group for the web tier

19. Question

A solutions architect has created a new AWS account and must secure AWS account root user access.

Which combination of actions will accomplish this? (Select TWO)

1: Ensure the root user uses a strong password

2: Enable multi-factor authentication to the root user

3: Store root user access keys in an encrypted Amazon S3 bucket

4: Add the root user to a group containing administrative permissions

5: Delete the root user account

20. Question

A company allows its developers to attach existing IAM policies to existing IAM roles to enable faster experimentation and agility. However, the security operations team is concerned that the developers could attach the existing administrator policy, which would allow the developers to circumvent any other security policies.

How should a solutions architect address this issue?

1: Create an Amazon SNS topic to send an alert every time a developer creates a new policy

2: Use service control policies to disable IAM activity across all accounts in the organizational unit

3: Prevent the developers from attaching any policies and assign all IAM duties to the security operations team

4: Set an IAM permissions boundary on the developer IAM role that explicitly denies attaching the administrator policy

21. Question

A solutions architect is optimizing a website for real-time streaming and on-demand videos. The website's users are located around the world and the solutions architect needs to optimize the performance for both the real-time and on-demand streaming.

Which service should the solutions architect choose?

1: Amazon CloudFront

2: AWS Global Accelerator

3: Amazon Route 53

4: Amazon S3 Transfer Acceleration

22. Question

An organization is creating a new storage solution and needs to ensure that Amazon S3 objects that are deleted are immediately restorable for up to 30 days. After 30 days the objects should be retained for a further 180 days and be restorable within 24 hours.

The solution should be operationally simple and cost-effective. How can these requirements be achieved? (Select TWO)

1: Enable object versioning on the Amazon S3 bucket that will contain the objects

3: Create a lifecycle rule to transition non-current versions to GLACIER after 30 days, and then expire the objects after 180 days

3: Enable multi-factor authentication (MFA) delete protection

4: Enable cross-region replication (CRR) for the Amazon S3 bucket that will contain the objects

5: Create a lifecycle rule to transition non-current versions to STANDARD_IA after 30 days, and then expire the objects after 180 days

23. Question

Objects uploaded to Amazon S3 are initially accessed frequently for a period of 30 days. Then, objects are infrequently accessed for up to 90 days. After that, the objects are no longer needed.

How should lifecycle management be configured?

1: Transition to STANDARD_IA after 30 days. After 90 days transition to GLACIER

2: Transition to STANDARD_IA after 30 days. After 90 days transition to ONEZONE_IA

3: Transition to ONEZONE_IA after 30 days. After 90 days expire the objects

4: Transition to REDUCED_REDUNDANCY after 30 days. After 90 days expire the objects

24. Question

A company has acquired another business and needs to migrate their 50TB of data into AWS within 1 month. They also require a secure, reliable and private connection to the AWS cloud.

How are these requirements best accomplished?

1: Provision an AWS Direct Connect connection and migrate the data over the link

2: Migrate data using AWS Snowball. Provision an AWS VPN initially and order a Direct Connect link

3: Launch a Virtual Private Gateway (VPG) and migrate the data over the AWS VPN

4: Provision an AWS VPN CloudHub connection and migrate the data over redundant links

25. Question

An application on Amazon Elastic Container Service (ECS) performs data processing in two parts. The second part takes much longer to complete. How can an Architect decouple the data processing from the backend application component?

1: Process both parts using the same ECS task. Create an Amazon Kinesis Firehose stream

2: Process each part using a separate ECS task. Create an Amazon SNS topic and send a notification when the processing completes

3: Create an Amazon DynamoDB table and save the output of the first part to the table

4: Process each part using a separate ECS task. Create an Amazon SQS queue

26. Question

An application is running on Amazon EC2 behind an Elastic Load Balancer (ELB). Content is being published using Amazon CloudFront and you need to restrict the ability for users to circumvent CloudFront and access the content directly through the ELB.

How can you configure this solution?

1: Create an Origin Access Identity (OAI) and associate it with the distribution

2: Use signed URLs or signed cookies to limit access to the content

3: Use a Network ACL to restrict access to the ELB

4: Create a VPC Security Group for the ELB and use AWS Lambda to automatically update the CloudFront internal service IP addresses when they change

27. Question

A company has divested a single business unit and needs to move the AWS account owned by the business unit to another AWS Organization. How can this be achieved?

1: Create a new account in the destination AWS Organization and migrate resources

2: Create a new account in the destination AWS Organization and share the original resources using AWS Resource Access Manager

3: Migrate the account using AWS CloudFormation

4: Migrate the account using the AWS Organizations console

28. Question

An application running on Amazon EC2 needs to regularly download large objects from Amazon S3. How can performance be optimized for high-throughput use cases?

1: Issue parallel requests and use byte-range fetches

2: Use Amazon S3 Transfer acceleration

3: Use Amazon CloudFront to cache the content

4: Use AWS Global Accelerator

29. Question

An Amazon RDS PostgreSQL database is configured as Multi-AZ. A solutions architect needs to scale read performance and the solution must be configured for high availability. What is the most cost-effective solution?

1: Create a read replica as a Multi-AZ DB instance

2: Deploy a read replica in a different AZ to the master DB instance

3: Deploy a read replica using Amazon ElastiCache

4: Deploy a read replica in the same AZ as the master DB instance

30. Question

A High Performance Computing (HPC) application will be migrated to AWS. The application requires low network latency and high throughput between nodes and will be deployed in a single AZ.

How should the application be deployed for best inter-node performance?

1: In a partition placement group

2: In a cluster placement group

3: In a spread placement group

4: Behind a Network Load Balancer (NLB)

31. Question

A web application is deployed in multiple regions behind an ELB Application Load Balancer. You need deterministic routing to the closest region and automatic failover. Traffic should traverse the AWS global network for consistent performance.

How can this be achieved?

1: Configure AWS Global Accelerator and configure the ALBs as targets

2: Place an EC2 Proxy in front of the ALB and configure automatic failover

3: Create a Route 53 Alias record for each ALB and configure a latency-based routing policy

4: Use a CloudFront distribution with multiple custom origins in each region and configure for high availability

32. Question

You are looking for a method to distribute onboarding videos to your company's numerous remote workers around the world. The training videos are located in an S3 bucket that is not publicly accessible. Which of the options below would allow you to share the videos?

1: Use CloudFront and set the S3 bucket as an origin

2: Use a Route 53 Alias record the points to the S3 bucket

3: Use ElastiCache and attach the S3 bucket as a cache origin

4: Use CloudFront and use a custom origin pointing to an EC2 instance

33. Question

A client is in the design phase of developing an application that will process orders for their online ticketing system. The application will use a number of front-end EC2 instances that pick-up orders and place them in a queue for processing by another set of back-end EC2 instances. The client will have multiple options for customers to choose the level of service they want to pay for.

The client has asked how he can design the application to process the orders in a prioritized way based on the level of service the customer has chosen?

1: Create multiple SQS queues, configure exactly-once processing and set the maximum visibility timeout to 12 hours

2: Create multiple SQS queues, configure the front-end application to place orders onto a specific queue based on the level of service requested and configure the back-end instances to sequentially poll the queues in order of priority

3: Create a combination of FIFO queues and Standard queues and configure the applications to place messages into the relevant queue based on priority

4: Create a single SQS queue, configure the front-end application to place orders on the queue in order of priority and configure the back-end instances to poll the queue and pick up messages in the order they are presented

34. Question

Your company is opening a new office in the Asia Pacific region. Users in the new office will need to read data from an RDS database that is hosted in the U.S. To improve performance, you are planning to implement a Read Replica of the database in the Asia Pacific region. However, your Chief Security Officer (CSO) has explained to you that the company policy dictates that all data that leaves the U.S must be encrypted at rest. The master RDS DB is not currently encrypted. What options are available to you? (Select TWO)

1: You can create an encrypted Read Replica that is encrypted with the same key

2: You can create an encrypted Read Replica that is encrypted with a different key

3: You can enable encryption for the master DB by creating a new DB from a snapshot with encryption enabled

4: You can enable encryption for the master DB through the management console

5: You can use an ELB to provide an encrypted transport layer in front of the RDS DB

35. Question

A company's Amazon EC2 instances were terminated or stopped, resulting in a loss of important data that was stored on attached EC2 instance stores. They want to avoid this happening in the future and

need a solution that can scale as data volumes increase with the LEAST amount of management and configuration.

Which storage is most appropriate?

1: Amazon EFS

2: Amazon S3

3: Amazon EBS

4: Amazon RDS

36. Question

You would like to grant additional permissions to an individual ECS application container on an ECS cluster that you have deployed. You would like to do this without granting additional permissions to the other containers that are running on the cluster.

How can you achieve this?

1: Create a separate Task Definition for the application container that uses a different Task Role

2: In the same Task Definition, specify a separate Task Role for the application container

3: Use EC2 instances instead as you can assign different IAM roles on each instance

4: You cannot implement granular permissions with ECS containers

37. Question

The development team in your company has created a new application that you plan to deploy on AWS which runs multiple components in Docker containers. You would prefer to use AWS managed infrastructure for running the containers as you do not want to manage EC2 instances.

Which of the below solution options would deliver these requirements? (Select TWO)

1: Use the Elastic Container Service (ECS) with the Fargate Launch Type

2: Put your container images in a private repository

3: Use the Elastic Container Service (ECS) with the EC2 Launch Type

4: Use CloudFront to deploy Docker on EC2

5: Put your container images in the Elastic Container Registry (ECR)

38. Question

A developer is creating a solution for a real-time bidding application for a large retail company that allows users to bid on items of end-of-season clothing. The application is expected to be extremely popular and the back-end DynamoDB database may not perform as required.

How can the Solutions Architect enable in-memory read performance with microsecond response times for the DynamoDB database?

1: Enable read replicas

2: Configure DynamoDB Auto Scaling

3: Configure Amazon DAX

4: Increase the provisioned throughput

39. Question

An application launched on Amazon EC2 instances needs to publish personally identifiable information (PII) about customers using Amazon SNS. The application is launched in private subnets within an Amazon VPC.

Which is the MOST secure way to allow the application to access service endpoints in the same region?

1: Use an Internet Gateway

2: Use AWS PrivateLink

3: Use a proxy instance

4: Use a NAT gateway

40. Question

A mobile client requires data from several application-layer services to populate its user interface. What can the application team use to decouple the client interface from the underlying services behind them?

1: AWS Device Farm

2: Amazon Cognito

3: Amazon API Gateway

4: Application Load Balancer

41. Question

A Solutions Architect is designing a web application that runs on Amazon EC2 instances behind an Elastic Load Balancer. All data in transit must be encrypted.

Which solution options meet the encryption requirement? (Select TWO)

1: Use a Network Load Balancer (NLB) with a TCP listener, then terminate SSL on EC2 instances

2: Use an Application Load Balancer (ALB) with an HTTPS listener, then install SSL certificates on the ALB and EC2 instances

3: Use an Application Load Balancer (ALB) in passthrough mode, then terminate SSL on EC2 instances

4: Use a Network Load Balancer (NLB) with an HTTPS listener, then install SSL certificates on the NLB and EC2 instances

5: Use an Application Load Balancer (ALB) with a TCP listener, then terminate SSL on EC2 instances

42. Question

An application running video-editing software is using significant memory on an Amazon EC2 instance. How can a user track memory usage on the Amazon EC2 instance?

1: Install the CloudWatch agent on the EC2 instance to push memory usage to an Amazon CloudWatch custom metric

2: Use an instance type that supports memory usage reporting to a metric by default

3: Call Amazon CloudWatch to retrieve the memory usage metric data that exists for the EC2 instance

4: Assign an IAM role to the EC2 instance with an IAM policy granting access to the desired metric

43. Question

A company hosts a popular web application that connects to an Amazon RDS MySQL DB instance running in a private VPC subnet that was created with default ACL settings. The web servers must be accessible only to customers on an SSL connection. The database should only be accessible to web servers in a public subnet.

Which solution meets these requirements without impacting other running applications? (Select TWO)

1: Create a DB server security group that allows MySQL port 3306 inbound and specify the source as a web server security group

2: Create a web server security group that allows HTTPS port 443 inbound traffic from Anywhere (0.0.0.0/0) and apply it to the web servers

3: Create a network ACL on the web server's subnet, allow HTTPS port 443 inbound, and specify the source as 0.0.0.0/0

4: Create a DB server security group that allows the HTTPS port 443 inbound and specify the source as a web server security group

5: Create a network ACL on the DB subnet, allow MySQL port 3306 inbound for web servers, and deny all outbound traffic

44. Question

The security team in your company is defining new policies for enabling security analysis, resource change tracking, and compliance auditing. They would like to gain visibility into user activity by recording API calls made within the company's AWS account. The information that is logged must be encrypted. This requirement applies to all AWS regions in which your company has services running.

How will you implement this request? (Select TWO)

1: Create a CloudTrail trail in each region in which you have services

2: Enable encryption with a single KMS key

3: Create a CloudTrail trail and apply it to all regions

4: Enable encryption with multiple KMS keys

5: Use CloudWatch to monitor API calls

45. Question

An organization is migrating data to the AWS cloud. An on-premises application uses Network File System shares and must access the data without code changes. The data is critical and is accessed frequently.

Which storage solution should a Solutions Architect recommend to maximize availability and durability?

1: Amazon Elastic Block Store

2: Amazon Simple Storage Service

3: AWS Storage Gateway – File Gateway

4: Amazon Elastic File System

46. Question

A bespoke application consisting of three tiers is being deployed in a VPC. You need to create three security groups. You have configured the WebSG (web server) security group and now need to configure the AppSG (application tier) and DBSG (database tier). The application runs on port 1030 and the database runs on 3306.

Which rules should be created according to security best practice? (Select TWO)

1: On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the AppSG security group as the source

2: On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the WebSG security group as the source

3: On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the DBSG security group as the source

4: On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the WebSG security group as the source

5: On the WebSG security group, create a custom TCP rule for TCP 1030 and configure the AppSG security group as the source

47. Question

A Solutions Architect needs to design a solution that will allow Website Developers to deploy static web content without managing server infrastructure. All web content must be accessed over HTTPS with a custom domain name. The solution should be scalable as the company continues to grow.

Which of the following will provide the MOST cost-effective solution?

1: Amazon S3 with a static website

2: Amazon CloudFront with an Amazon S3 bucket origin

3: AWS Lambda function with Amazon API Gateway

4: Amazon EC2 instance with Amazon EBS

48. Question

A Solutions Architect must design a storage solution for incoming billing reports in CSV format. The data will be analyzed infrequently

and discarded after 30 days.
Which combination of services will be MOST cost-effective in meeting these requirements?
1: Write the files to an S3 bucket and use Amazon Athena to query the data
2: Import the logs to an Amazon Redshift cluster
3: Use AWS Data Pipeline to import the logs into a DynamoDB table
4: Import the logs into an RDS MySQL instance

49. Question
A Solutions Architect must design a solution that encrypts data in Amazon S3. Corporate policy mandates encryption keys be generated and managed on premises. Which solution should the Architect use to meet the security requirements?
1: SSE-C: Server-side encryption with customer-provided encryption keys
2: SSE-S3: Server-side encryption with Amazon-managed master key
3: SSE-KMS: Server-side encryption with AWS KMS managed keys
4: AWS CloudHSM

50. Question
A Solutions Architect must select the most appropriate database service for two use cases. A team of data scientists perform complex queries on a data warehouse that take several hours to complete. Another team of scientists need to run fast, repeat queries and update dashboards for customer support staff.
Which solution delivers these requirements MOST cost-effectively?
1: RedShift for both use cases
2: RDS for both use cases
3: RedShift for the analytics use case and ElastiCache in front of RedShift for the customer support dashboard
4: RedShift for the analytics use case and RDS for the customer support dashboard

51. Question
A DynamoDB database you manage is randomly experiencing heavy read requests that are causing latency. What is the simplest way to

alleviate the performance issues?

1: Create DynamoDB read replicas

2: Enable EC2 Auto Scaling for DynamoDB

3: Create an ElastiCache cluster in front of DynamoDB

4: Enable DynamoDB DAX

52. Question

A customer has a production application running on Amazon EC2. The application frequently overwrites and deletes data, and it is essential that the application receives the most up-to-date version of the data whenever it is requested.

Which service is most appropriate for these requirements?

1: Amazon RedShift

2: Amazon S3

3: AWS Storage Gateway

4: Amazon RDS

53. Question

A Solutions Architect is developing a new web application on AWS that needs to be able to scale to support unpredictable workloads. The Architect prefers to focus on value-add activities such as software development and product roadmap development rather than provisioning and managing instances.

Which solution is most appropriate for this use case?

1: Amazon API Gateway and AWS Lambda

2: Elastic Load Balancing with Auto Scaling groups and Amazon EC2

3: Amazon CloudFront and AWS Lambda

4: Amazon API Gateway and Amazon EC2

54. Question

A client needs to implement a shared directory system. Requirements are that it should provide a hierarchical structure, support strong data consistency, and be accessible from multiple accounts, regions and on-premises servers using their AWS Direct Connect link.

Which storage service would you recommend to the client?

1: AWS Storage Gateway
2: Amazon EBS
3: Amazon EFS
4: Amazon S3

55. Question

A customer runs an API on their website that receives around 1,000 requests each day and has an average response time of 50 ms. It is currently hosted on a single c4.large EC2 instance.

How can high availability be added to the architecture at the LOWEST cost?

1: Create an Auto Scaling group with a minimum of one instance and a maximum of two instances, then use an Application Load Balancer to balance the traffic

2: Recreate the API using API Gateway and use AWS Lambda as the service back-end

3: Create an Auto Scaling group with a maximum of two instances, then use an Application Load Balancer to balance the traffic

4: Recreate the API using API Gateway and integrate the API with the existing back-end

56. Question

A large media site has multiple applications running on Amazon ECS. A Solutions Architect needs to use content metadata to route traffic to specific services.

What is the MOST efficient method to fulfil this requirement?

1: Use an AWS Classic Load Balancer with a host-based routing rule to route traffic to the correct service

2: Use the AWS CLI to update an Amazon Route 53 hosted zone to route traffic as services get updated

3: Use an AWS Application Load Balancer with a path-based routing rule to route traffic to the correct service

4: Use Amazon CloudFront to manage and route traffic to the correct service

57. Question

You have created a file system using Amazon Elastic File System (EFS) which will hold home directories for users. What else needs to be done to enable users to save files to the EFS file system?

1: Create a separate EFS file system for each user and grant read-write-execute permissions on the root directory to the respective user. Then mount the file system to the users' home directory

2: Modify permissions on the root directory to grant read-write-execute permissions to the users. Then create a subdirectory and mount it to the users' home directory

3: Instruct the users to create a subdirectory on the file system and mount the subdirectory to their home directory

4: Create a subdirectory for each user and grant read-write-execute permissions to the users. Then mount the subdirectory to the users' home directory

58. Question

An application that you will be deploying in your VPC requires 14 EC2 instances that must be placed on distinct underlying hardware to reduce the impact of the failure of a hardware node. The instances will use varying instance types. What configuration will cater to these requirements taking cost-effectiveness into account?

1: You cannot control which nodes your instances are placed on

2: Use dedicated hosts and deploy each instance on a dedicated host

3: Use a Spread Placement Group across two AZs

4: Use a Cluster Placement Group within a single AZ

59. Question

A VPC has a fleet of EC2 instances running in a private subnet that need to connect to Internet-based hosts using the IPv6 protocol. What needs to be configured to enable this connectivity?

1: VPN CloudHub

2: A NAT Gateway

3: An Egress-Only Internet Gateway

4: AWS Direct Connect

60. Question

An AWS workload in a VPC is running a legacy database on an Amazon EC2 instance. Data is stored on a 2000GB Amazon EBS (gp2) volume. At peak load times, logs show excessive wait time.

What should be implemented to improve database performance using persistent storage?

1: Change the EC2 instance type to one with burstable performance

2: Change the EC2 instance type to one with EC2 instance store volumes

3: Migrate the data on the Amazon EBS volume to an SSD-backed volume

4: Migrate the data on the EBS volume to provisioned IOPS SSD (io1)

61. Question

Developers regularly create and update CloudFormation stacks using API calls. For security reasons you need to ensure that users are restricted to a specified template. How can this be achieved?

1: Store the template on Amazon S3 and use a bucket policy to restrict access

2: Create an IAM policy with a Condition: ResourceTypes parameter

3: Create an IAM policy with a Condition: TemplateURL parameter

4: Create an IAM policy with a Condition: StackPolicyURL parameter

62. Question

A data-processing application runs on an i3.large EC2 instance with a single 100 GB EBS gp2 volume. The application stores temporary data in a small database (less than 30 GB) located on the EBS root volume. The application is struggling to process the data fast enough, and a Solutions Architect has determined that the I/O speed of the temporary database is the bottleneck.

What is the MOST cost-efficient way to improve the database response times?

1: Put the temporary database on a new 50-GB EBS io1 volume with a 3000 IOPS allocation

2: Move the temporary database onto instance storage

3: Put the temporary database on a new 50-GB EBS gp2 volume

4: Enable EBS optimization on the instance and keep the temporary files on the existing volume

63. Question

A Solutions Architect is designing a shared service for hosting containers from several customers on Amazon ECS. These containers will use several AWS services. A container from one customer must not be able to access data from another customer.

Which solution should the Architect use to meet the requirements?

1: IAM roles for tasks

2: IAM roles for EC2 instances

3: IAM Instance Profile for EC2 instances

4: Network ACL

64. Question

An EC2 instance that you manage has an IAM role attached to it that provides it with access to Amazon S3 for saving log data to a bucket. A change in the application architecture means that you now need to provide the additional ability for the application to securely make API requests to Amazon API Gateway.

Which two methods could you use to resolve this challenge? (Select TWO)

1: Delegate access to the EC2 instance from the API Gateway management console

2: Create an IAM role with a policy granting permissions to Amazon API Gateway and add it to the EC2 instance as an additional IAM role

3: You cannot modify the IAM role assigned to an EC2 instance after it has been launched. You'll need to recreate the EC2 instance and assign a new IAM role

4: Add an IAM policy to the existing IAM role that the EC2 instance is using granting permissions to access Amazon API Gateway

5: Create a new IAM role with multiple IAM policies attached that grants access to Amazon S3 and Amazon API Gateway, and replace the existing IAM role that is attached to the EC2 instance

65. Question

An application is hosted on the U.S west coast. Users there have no problems, but users on the east coast are experiencing performance issues. The users have reported slow response times with the search bar autocomplete and display of account listings.

How can you improve the performance for users on the east coast?

1: Host the static content in an Amazon S3 bucket and distribute it using CloudFront

2: Setup cross-region replication and use Route 53 geolocation routing

3: Create a DynamoDB Read Replica in the U.S east region

4: Create an ElastiCache database in the U.S east region

SET 2: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

A development team needs to host a website that will be accessed by other teams. The website contents consist of HTML, CSS, client-side JavaScript, and images. A Solutions Architect has been asked to recommend a solution for hosting the website.

Which solution is the MOST cost-effective?

1: Containerize the website and host it in AWS Fargate

2: Create an Amazon S3 bucket and host the website there

3: Deploy a web server on an Amazon EC2 instance to host the website

4: Configure an Application Load Balancer with an AWS Lambda target

Answer: 2

Explanation:

You can use Amazon S3 to host a static website. On a *static* website, individual webpages include static content. They might also contain client-side scripts.

To host a static website on Amazon S3, you configure an Amazon S3 bucket for website hosting and then upload your website content to the bucket. When you configure a bucket as a static website, you must enable website hosting, set permissions, and create and add an index document. Depending on your website requirements, you can also configure redirects, web traffic logging, and a custom error document.

This use case can be well served by using an S3 static website and this will be the most cost-effective option.

CORRECT: "Create an Amazon S3 bucket and host the website there" is the correct answer.

INCORRECT: "Containerize the website and host it in AWS Fargate" is incorrect as this is not the most cost-effective option.

INCORRECT: "Deploy a web server on an Amazon EC2 instance to host the website" is incorrect as this is not the most cost-effective option.

INCORRECT: "Configure an Application Load Balancer with an AWS Lambda target" is incorrect as this is not the most cost-effective option and is an incomplete solution.

2. Question

A company requires a solution to allow customers to customize images that are stored in an online catalog. The image customization parameters will be sent in requests to Amazon API Gateway. The customized image will then be generated on-demand and can be accessed online.

The solutions architect requires a highly available solution. Which solution will be MOST cost-effective?

1: Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original and manipulated images in Amazon S3. Configure an Elastic Load Balancer in front of the EC2 instances

2: Use AWS Lambda to manipulate the original images to the requested customization. Store the original and manipulated images in Amazon S3. Configure an Amazon CloudFront distribution with the S3 bucket as the origin

3: Use AWS Lambda to manipulate the original images to the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Elastic Load Balancer in front of the Amazon EC2 instances

4: Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Amazon CloudFront distribution with the S3 bucket as the origin

Answer: 2

Explanation:

All solutions presented are highly available. The key requirement that must be satisfied is that the solution should be cost-effective and you must choose the most cost-effective option.

Therefore, it’s best to eliminate services such as Amazon EC2 and ELB as these require ongoing costs even when they’re not used. Instead, a fully

serverless solution should be used. AWS Lambda, Amazon S3 and CloudFront are the best services to use for these requirements.

CORRECT: "Use AWS Lambda to manipulate the original images to the requested customization. Store the original and manipulated images in Amazon S3. Configure an Amazon CloudFront distribution with the S3 bucket as the origin" is the correct answer.

INCORRECT: "Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original and manipulated images in Amazon S3. Configure an Elastic Load Balancer in front of the EC2 instances" is incorrect. This is not the most cost-effective option as the ELB and EC2 instances will incur costs even when not used.

INCORRECT: "Use AWS Lambda to manipulate the original images to the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Elastic Load Balancer in front of the Amazon EC2 instances" is incorrect. This is not the most cost-effective option as the ELB will incur costs even when not used. Also, Amazon DynamoDB will incur RCU/WCUs when running and is not the best choice for storing images.

INCORRECT: "Use Amazon EC2 instances to manipulate the original images into the requested customization. Store the original images in Amazon S3 and the manipulated images in Amazon DynamoDB. Configure an Amazon CloudFront distribution with the S3 bucket as the origin" is incorrect. This is not the most cost-effective option as the EC2 instances will incur costs even when not used

3. Question

A solutions architect is finalizing the architecture for a distributed database that will run across multiple Amazon EC2 instances. Data will be replicated across all instances so the loss of an instance will not cause loss of data. The database requires block storage with low latency and throughput that supports up to several million transactions per second per server.

Which storage solution should the solutions architect use?

1: Amazon EBS

2: Amazon EC2 instance store

3: Amazon EFS

4: Amazon S3

Answer: 2

Explanation:

An *instance store* provides temporary block-level storage for your instance. This storage is located on disks that are physically attached to the host computer. Instance store is ideal for temporary storage of information that changes frequently, such as buffers, caches, scratch data, and other temporary content, or for data that is replicated across a fleet of instances, such as a load-balanced pool of web servers.

Some instance types use NVMe or SATA-based solid state drives (SSD) to deliver high random I/O performance. This is a good option when you need storage with very low latency, but you don't need the data to persist when the instance terminates or you can take advantage of fault-tolerant architectures.

In this scenario the data is replicated and fault tolerant so the best option to provide the level of performance required is to use instance store volumes.

CORRECT: "Amazon EC2 instance store" is the correct answer.

INCORRECT: "Amazon EBS " is incorrect. The Elastic Block Store (EBS) is a block storage device but as the data is distributed and fault tolerant a better option for performance would be to use instance stores.

INCORRECT: "Amazon EFS " is incorrect as EFS is not a block device, it is a filesystem that is accessed using the NFS protocol.

INCORRECT: "Amazon S3" is incorrect as S3 is an object-based storage system, not a block-based storage system.

4. Question

A website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The website's DNS records are hosted in Amazon Route 53 with the domain name pointing to the ALB. A solution is required for displaying a static error page if the website becomes unavailable.

Which configuration should a solutions architect use to meet these requirements with the LEAST operational overhead?

1: Create a Route 53 alias record for an Amazon CloudFront distribution and specify the ALB as the origin. Create custom error pages for the distribution

2: Create a Route 53 active-passive failover configuration. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the static website as the passive record for failover

3: Create a Route 53 weighted routing policy. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the record for the S3 static website with a weighting of zero. When an issue occurs increase the weighting

4: Set up a Route 53 active-active configuration with the ALB and an Amazon EC2 instance hosting a static error page as endpoints. Route 53 will only send requests to the instance if the health checks fail for the ALB

Answer: 1

Explanation:

Using Amazon CloudFront as the front-end provides the option to specify a custom message instead of the default message. To specify the specific file that you want to return and the errors for which the file should be returned, you update your CloudFront distribution to specify those values.

The CloudFront distribution can use the ALB as the origin, which will cause the website content to be cached on the CloudFront edge caches.

This solution represents the most operationally efficient choice as no action is required in the event of an issue, other than troubleshooting the root cause.

CORRECT: "Create a Route 53 alias record for an Amazon CloudFront distribution and specify the ALB as the origin. Create custom error pages for the distribution" is the correct answer.

INCORRECT: "Create a Route 53 active-passive failover configuration. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the static website as the passive record for failover" is incorrect. This option does not represent the lowest operational overhead as manual intervention would be required to cause a fail-back to the main website.

INCORRECT: "Create a Route 53 weighted routing policy. Create a static website using an Amazon S3 bucket that hosts a static error page. Configure the record for the S3 static website with a weighting of zero. When an issue occurs increase the weighting" is incorrect. This option requires manual intervention and there would be a delay from the issue arising before an administrative action could make the changes.

INCORRECT: "Set up a Route 53 active-active configuration with the ALB and an Amazon EC2 instance hosting a static error page as endpoints. Route 53 will only send requests to the instance if the health checks fail for the ALB" is incorrect. With an active-active configuration traffic would be split between the website and the error page.

5. Question

A company is deploying a new web application that will run on Amazon EC2 instances in an Auto Scaling group across multiple Availability Zones. The application requires a shared storage solution that offers strong consistency as the content will be regularly updated.

Which solution requires the LEAST amount of effort?

1: Create an Amazon S3 bucket to store the web content and use Amazon CloudFront to deliver the content

2: Create an Amazon Elastic File System (Amazon EFS) file system and mount it on the individual Amazon EC2 instances

3: Create a shared Amazon Block Store (Amazon EBS) volume and mount it on the individual Amazon EC2 instances

4: Create a volume gateway using AWS Storage Gateway to host the data and mount it to the Auto Scaling group

Answer: 2

Explanation:

Amazon EFS is a fully-managed service that makes it easy to set up, scale, and cost-optimize file storage in the Amazon Cloud. EFS file systems are accessible to Amazon EC2 instances via a file system interface (using standard operating system file I/O APIs) and support full file system access semantics (such as strong consistency and file locking).

EFS is a good solution for when you need to attach a shared filesystem to multiple EC2 instances across multiple Availability Zones.

CORRECT: "Create an Amazon Elastic File System (Amazon EFS) file system and mount it on the individual Amazon EC2 instances" is the correct answer.

INCORRECT: "Create an Amazon S3 bucket to store the web content and use Amazon CloudFront to deliver the content" is incorrect as this may

require more effort in terms of reprogramming the application to use the S3 API.

INCORRECT: "Create a shared Amazon Block Store (Amazon EBS) volume and mount it on the individual Amazon EC2 instances" is incorrect. Please note that you can multi-attach an EBS volume to multiple EC2 instances but the instances must be in the same AZ.

INCORRECT: "Create a volume gateway using AWS Storage Gateway to host the data and mount it to the Auto Scaling group" is incorrect as a storage gateway is used on-premises.

6. Question

A website runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The website has a mix of dynamic and static content. Customers around the world are reporting performance issues with the website.

Which set of actions will improve website performance for users worldwide?

1: Create an Amazon CloudFront distribution and configure the ALB as an origin. Then update the Amazon Route 53 record to point to the CloudFront distribution

2: Create a latency-based Amazon Route 53 record for the ALB. Then launch new EC2 instances with larger instance sizes and register the instances with the ALB

3: Launch new EC2 instances hosting the same web application in different Regions closer to the users. Use an AWS Transit Gateway to connect customers to the closest region

4: Migrate the website to an Amazon S3 bucket in the Regions closest to the users. Then create an Amazon Route 53 geolocation record to point to the S3 buckets

Answer: 1

Explanation:

Amazon CloudFront is a content delivery network (CDN) that improves website performance by caching content at edge locations around the world. It can serve both dynamic and static content. This is the best solution for improving the performance of the website.

CORRECT: "Create an Amazon CloudFront distribution and configure the ALB as an origin. Then update the Amazon Route 53 record to point to the CloudFront distribution" is the correct answer.

INCORRECT: "Create a latency-based Amazon Route 53 record for the ALB. Then launch new EC2 instances with larger instance sizes and register the instances with the ALB" is incorrect. Latency routing routes based on the latency between the client and AWS. There is no mention in the answer about creating the new instances in another region therefore the only advantage is in using larger instance sizes. For a dynamic site this adds complexity in keeping the instances in sync.

INCORRECT: "Launch new EC2 instances hosting the same web application in different Regions closer to the users. Use an AWS Transit Gateway to connect customers to the closest region" is incorrect as Transit Gateway is a service for connecting on-premises networks and VPCs to a single gateway.

INCORRECT: "Migrate the website to an Amazon S3 bucket in the Regions closest to the users. Then create an Amazon Route 53 geolocation record to point to the S3 buckets" is incorrect as with S3 you can only host static websites, not dynamic websites.

7. Question

A web application has recently been launched on AWS. The architecture includes two tier with a web layer and a database later. It has been identified that the web server layer may be vulnerable to cross-site scripting (XSS) attacks.

What should a solutions architect do to remediate the vulnerability?

1: Create a Classic Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

2: Create a Network Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

3: Create an Application Load Balancer. Put the web layer behind the load balancer and enable AWS WAF

4: Create an Application Load Balancer. Put the web layer behind the load balancer and use AWS Shield Standard

Answer: 3

Explanation:

The AWS Web Application Firewall (WAF) is available on the Application Load Balancer (ALB). You can use AWS WAF directly on Application Load Balancers (both internal and external) in a VPC, to protect your websites and web services.

Attackers sometimes insert scripts into web requests in an effort to exploit vulnerabilities in web applications. You can create one or more cross-site scripting match conditions to identify the parts of web requests, such as the URI or the query string, that you want AWS WAF to inspect for possible malicious scripts.

CORRECT: "Create an Application Load Balancer. Put the web layer behind the load balancer and enable AWS WAF" is the correct answer.

INCORRECT: "Create a Classic Load Balancer. Put the web layer behind the load balancer and enable AWS WAF" is incorrect as you cannot use AWS WAF with a classic load balancer.

INCORRECT: "Create a Network Load Balancer. Put the web layer behind the load balancer and enable AWS WAF" is incorrect as you cannot use AWS WAF with a network load balancer.

INCORRECT: "Create an Application Load Balancer. Put the web layer behind the load balancer and use AWS Shield Standard" is incorrect as you cannot use AWS Shield to protect against XSS attacks. Shield is used to protect against DDoS attacks.

8. Question

A static website currently runs in a company's on-premises data center. The company plan to migrate the website to AWS. The website must load quickly for global users and the solution must also be cost-effective. What should a solutions architect do to accomplish this?

1: Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Replicate the S3 bucket to multiple AWS Regions

2: Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Configure Amazon CloudFront with the S3 bucket as the origin

3: Copy the website content to an Amazon EC2 instance. Configure Amazon Route 53 geolocation routing policies to select the closest origin

4: Copy the website content to multiple Amazon EC2 instances in multiple AWS Regions. Configure AWS Route 53 geolocation routing policies to select the closest region

Answer: 2

Explanation:

The most cost-effective option is to migrate the website to an Amazon S3 bucket and configure that bucket for static website hosting. To enable good performance for global users the solutions architect should then configure a CloudFront distribution with the S3 bucket as the origin. This will cache the static content around the world closer to users.

CORRECT: "Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Configure Amazon CloudFront with the S3 bucket as the origin" is the correct answer.

INCORRECT: "Copy the website content to an Amazon S3 bucket. Configure the bucket to serve static webpage content. Replicate the S3 bucket to multiple AWS Regions" is incorrect as there is no solution here for directing users to the closest region. This could be a more cost-effective (though less elegant) solution if AWS Route 53 latency records are created.

INCORRECT: "Copy the website content to an Amazon EC2 instance. Configure Amazon Route 53 geolocation routing policies to select the closest origin" is incorrect as using Amazon EC2 instances is less cost-effective compared to hosting the website on S3. Also, geolocation routing does not achieve anything with only a single record.

INCORRECT: "Copy the website content to multiple Amazon EC2 instances in multiple AWS Regions. Configure AWS Route 53 geolocation routing policies to select the closest region" is incorrect as using Amazon EC2 instances is less cost-effective compared to hosting the website on S3.

9. Question

A multi-tier application runs with eight front-end web servers in an Amazon EC2 Auto Scaling group in a single Availability Zone behind an Application Load Balancer. A solutions architect needs to modify the infrastructure to be highly available without modifying the application.

Which architecture should the solutions architect choose that provides high availability?

1: Create an Auto Scaling group that uses four instances across each of two Regions

2: Modify the Auto Scaling group to use four instances across each of two Availability Zones

3: Create an Auto Scaling template that can be used to quickly create more instances in another Region

4: Create an Auto Scaling group that uses four instances across each of two subnets

Answer: 2

Explanation:

High availability can be enabled for this architecture quite simply by modifying the existing Auto Scaling group to use multiple availability zones. The ASG will automatically balance the load so you don't actually need to specify the instances per AZ.

CORRECT: "Modify the Auto Scaling group to use four instances across each of two Availability Zones" is the correct answer.

INCORRECT: "Create an Auto Scaling group that uses four instances across each of two Regions" is incorrect as EC2 Auto Scaling does not support multiple regions.

INCORRECT: "Create an Auto Scaling template that can be used to quickly create more instances in another Region" is incorrect as EC2 Auto Scaling does not support multiple regions.

INCORRECT: "Create an Auto Scaling group that uses four instances across each of two subnets" is incorrect as the subnets could be in the same AZ.

10. Question

A company's web application is using multiple Amazon EC2 Linux instances and storing data on Amazon EBS volumes. The company is looking for a solution to increase the resiliency of the application in case of a failure. What should a solutions architect do to meet these requirements?

1: Launch the application on EC2 instances in each Availability Zone. Attach EBS volumes to each EC2 instance

2: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Mount an instance store on each EC2 instance

3: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data on Amazon EFS and mount a target on each instance

4: Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data using Amazon S3 One Zone-Infrequent Access (S3 One Zone-A)

Answer: 3

Explanation:

To increase the resiliency of the application the solutions architect can use Auto Scaling groups to launch and terminate instances across multiple availability zones based on demand. An application load balancer (ALB) can be used to direct traffic to the web application running on the EC2 instances.

Lastly, the Amazon Elastic File System (EFS) can assist with increasing the resilience of the application by providing a shared file system that can be mounted by multiple EC2 instances from multiple availability zones.

CORRECT: "Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data on Amazon EFS and mount a target on each instance" is the correct answer.

INCORRECT: "Launch the application on EC2 instances in each Availability Zone. Attach EBS volumes to each EC2 instance" is incorrect as the EBS volumes are single points of failure which are not shared with other instances.

INCORRECT: "Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Mount an instance store on each EC2 instance" is incorrect as instance stores are ephemeral data stores which means data is lost when powered down. Also, instance stores cannot be shared between instances.

INCORRECT: "Create an Application Load Balancer with Auto Scaling groups across multiple Availability Zones. Store data using Amazon S3 One Zone-Infrequent Access (S3 One Zone-IA)" is incorrect as there are data retrieval charges associated with this S3 tier. It is not a suitable storage tier for application files.

11. Question

A website runs on a Microsoft Windows server in an on-premises data center. The web server is being migrated to Amazon EC2 Windows instances in multiple Availability Zones on AWS. The web server currently uses data stored in an on-premises network-attached storage (NAS) device.

Which replacement to the NAS file share is MOST resilient and durable?

1: Migrate the file share to Amazon EBS

2: Migrate the file share to AWS Storage Gateway

3: Migrate the file share to Amazon FSx for Windows File Server

4: Migrate the file share to Amazon Elastic File System (Amazon EFS)

Answer: 3

Explanation:

Amazon FSx for Windows File Server provides fully managed, highly reliable file storage that is accessible over the industry-standard Server Message Block (SMB) protocol. It is built on Windows Server, delivering a wide range of administrative features such as user quotas, end-user file restore, and Microsoft Active Directory (AD) integration. It offers single-AZ and multi-AZ deployment options, fully managed backups, and encryption of data at rest and in transit.

This is the only solution presented that provides resilient storage for Windows instances.

CORRECT: "Migrate the file share to Amazon FSx for Windows File Server" is the correct answer.

INCORRECT: "Migrate the file share to Amazon Elastic File System (Amazon EFS)" is incorrect as you cannot use Windows instances with Amazon EFS.

INCORRECT: "Migrate the file share to Amazon EBS" is incorrect as this is not a shared storage solution for multi-AZ deployments.

INCORRECT: "Migrate the file share to AWS Storage Gateway" is incorrect as with Storage Gateway replicated files end up on Amazon S3. The replacement storage solution should be a file share, not an object-based storage system.

12. Question

A company is planning a migration for a high performance computing (HPC) application and associated data from an on-premises data center to the AWS Cloud. The company uses tiered storage on premises with hot high-performance parallel storage to support the application during periodic runs of the application, and more economical cold storage to hold the data when the application is not actively running.

Which combination of solutions should a solutions architect recommend to support the storage needs of the application? (Select TWO)

1: Amazon S3 for cold data storage

2: Amazon EFS for cold data storage

3: Amazon S3 for high-performance parallel storage

4: Amazon FSx for Lustre for high-performance parallel storage

5: Amazon FSx for Windows for high-performance parallel storage

Answer: 1,4

Explanation:

Amazon FSx for Lustre provides a high-performance file system optimized for fast processing of workloads such as machine learning, high performance computing (HPC), video processing, financial modeling, and electronic design automation (EDA).

These workloads commonly require data to be presented via a fast and scalable file system interface, and typically have data sets stored on long-term data stores like Amazon S3.

Amazon FSx works natively with Amazon S3, making it easy to access your S3 data to run data processing workloads. Your S3 objects are presented as files in your file system, and you can write your results back to S3. This lets you run data processing workloads on FSx for Lustre and store your long-term data on S3 or on-premises data stores.

Therefore, the best combination for this scenario is to use S3 for cold data and FSx for Lustre for the parallel HPC job.

CORRECT: "Amazon S3 for cold data storage" is the correct answer.

CORRECT: "Amazon FSx for Lustre for high-performance parallel storage" is the correct answer.

INCORRECT: "Amazon EFS for cold data storage" is incorrect as FSx works natively with S3 which is also more economical.

INCORRECT: "Amazon S3 for high-performance parallel storage" is incorrect as S3 is not suitable for running high-performance computing jobs.

INCORRECT: "Amazon FSx for Windows for high-performance parallel storage" is incorrect as FSx for Lustre should be used for HPC use cases and use cases that require storing data on S3.

13. Question

A web application that allows users to upload and share documents is running on a single Amazon EC2 instance with an Amazon EBS volume. To increase availability the architecture has been updated to use an Auto Scaling group of several instances across Availability Zones behind an Application Load Balancer. After the change users can only see a subset of the documents.

What is the BEST method for a solutions architect to modify the solution so users can see all documents?

1: Run a script to synchronize the data between Amazon EBS volumes

2: Use Sticky Sessions with the ALB to ensure users are directed to the same EC2 instance in a session

3: Copy the data from all EBS volumes to Amazon EFS. Modify the application to save new documents to Amazon EFS

4: Configure the Application Load Balancer to send the request to all servers. Return each document from the correct server

Answer: 3

Explanation:

The problem that is being described is that the users are uploading the documents to an individual EC2 instance with a local EBS volume. Therefore, as EBS volumes cannot be shared across AZs, the data is stored separately and the ALB will be distributing incoming connections to different instances / data sets.

The simple resolution is to implement a shared storage layer for the documents so that they can be stored in one place and seen by any user who connects no matter which instance they connect to.

CORRECT: "Copy the data from all EBS volumes to Amazon EFS. Modify the application to save new documents to Amazon EFS" is the correct answer.

INCORRECT: "Run a script to synchronize the data between Amazon EBS volumes" is incorrect. This is a complex and messy approach. A better solution is to use a shared storage layer.

INCORRECT: "Use Sticky Sessions with the ALB to ensure users are directed to the same EC2 instance in a session" is incorrect as this will just "stick" a user to the same instance. They won't see documents uploaded to other instances / EBS volumes.

INCORRECT: "Configure the Application Load Balancer to send the request to all servers. Return each document from the correct server" is incorrect as there is no mechanism here for selecting a specific document. The requirement also requests that all documents are visible.

14. Question

A company runs an internal browser-based application. The application runs on Amazon EC2 instances behind an Application Load Balancer. The instances run in an Amazon EC2 Auto Scaling group across multiple Availability Zones. The Auto Scaling group scales up to 20 instances during work hours, but scales down to 2 instances overnight. Staff are complaining that the application is very slow when the day begins, although it runs well by midmorning.

How should the scaling be changed to address the staff complaints and keep costs to a minimum?

1: Implement a scheduled action that sets the desired capacity to 20 shortly before the office opens

2: Implement a step scaling action triggered at a lower CPU threshold, and decrease the cooldown period

3: Implement a target tracking action triggered at a lower CPU threshold, and decrease the cooldown period

4: Implement a scheduled action that sets the minimum and maximum capacity to 20 shortly before the office opens

Answer: 3

Explanation:

Though this sounds like a good use case for scheduled actions, both answers using scheduled actions will have 20 instances running regardless of actual

demand. A better option to be more cost effective is to use a target tracking action that triggers at a lower CPU threshold.

With this solution the scaling will occur before the CPU utilization gets to a point where performance is affected. This will result in resolving the performance issues whilst minimizing costs. Using a reduced cooldown period will also more quickly terminate unneeded instances, further reducing costs.

CORRECT: "Implement a target tracking action triggered at a lower CPU threshold, and decrease the cooldown period" is the correct answer.

INCORRECT: "Implement a scheduled action that sets the desired capacity to 20 shortly before the office opens" is incorrect as this is not the most cost-effective option. Note you can choose min, max, or desired for a scheduled action.

INCORRECT: "Implement a scheduled action that sets the minimum and maximum capacity to 20 shortly before the office opens" is incorrect as this is not the most cost-effective option. Note you can choose min, max, or desired for a scheduled action.

INCORRECT: "Implement a step scaling action triggered at a lower CPU threshold, and decrease the cooldown period" is incorrect as AWS recommend you use target tracking in place of step scaling for most use cases.

15. Question

An application uses Amazon EC2 instances and an Amazon RDS MySQL database. The database is not currently encrypted. A solutions architect needs to apply encryption to the database for all new and existing data. How should this be accomplished?

1: Create an Amazon ElastiCache cluster and encrypt data using the cache nodes

2: Enable encryption for the database using the API. Take a full snapshot of the database. Delete old snapshots

3: Take a snapshot of the RDS instance. Create an encrypted copy of the snapshot. Restore the RDS instance from the encrypted snapshot

4: Create an RDS read replica with encryption at rest enabled. Promote the read replica to master and switch the application over to the new master. Delete the old RDS instance

Answer: 3

Explanation:

There are some limitations for encrypted Amazon RDS DB Instances : you can't modify an existing unencrypted Amazon RDS DB instance to make the instance encrypted, and you can't create an encrypted read replica from an unencrypted instance.

However, you can use the Amazon RDS snapshot feature to encrypt an unencrypted snapshot that's taken from the RDS database that you want to encrypt. Restore a new RDS DB instance from the encrypted snapshot to deploy a new encrypted DB instance. Finally, switch your connections to the new DB instance.

CORRECT: "Take a snapshot of the RDS instance. Create an encrypted copy of the snapshot. Restore the RDS instance from the encrypted snapshot" is the correct answer.

INCORRECT: "Create an Amazon ElastiCache cluster and encrypt data using the cache nodes" is incorrect as you cannot encrypt an RDS database using an ElastiCache cache node.

INCORRECT: "Enable encryption for the database using the API. Take a full snapshot of the database. Delete old snapshots" is incorrect as you cannot enable encryption for an existing database.

INCORRECT: "Create an RDS read replica with encryption at rest enabled. Promote the read replica to master and switch the application over to the new master. Delete the old RDS instance" is incorrect as you cannot create an encrypted read replica from an unencrypted database instance.

16. Question

A company have 500 TB of data in an on-premises file share that needs to be moved to Amazon S3 Glacier. The migration must not saturate the company's low-bandwidth internet connection and the migration must be completed within a few weeks.

What is the MOST cost-effective solution?

1: Create an AWS Direct Connect connection and migrate the data straight into Amazon Glacier

2: Order 7 AWS Snowball appliances and select an S3 Glacier vault as the destination. Create a bucket policy to enforce a VPC endpoint

3: Use AWS Global Accelerator to accelerate upload and optimize usage of the available bandwidth

4: Order 7 AWS Snowball appliances and select an Amazon S3 bucket as the destination. Create a lifecycle policy to transition the S3 objects to Amazon S3 Glacier

Answer: 4

Explanation:

As the company's internet link is low-bandwidth uploading directly to Amazon S3 (ready for transition to Glacier) would saturate the link. The best alternative is to use AWS Snowball appliances. The Snowball edge appliance can hold up to 80 TB of data so 7 devices would be required to migrate 500 TB of data.

Snowball moves data into AWS using a hardware device and the data is then copied into an Amazon S3 bucket of your choice. From there, lifecycle policies can transition the S3 objects to Amazon S3 Glacier.

CORRECT: "Order 7 AWS Snowball appliances and select an Amazon S3 bucket as the destination. Create a lifecycle policy to transition the S3 objects to Amazon S3 Glacier" is the correct answer.

INCORRECT: "Order 7 AWS Snowball appliances and select an S3 Glacier vault as the destination. Create a bucket policy to enforce a VPC endpoint" is incorrect as you cannot set a Glacier vault as the destination, it must be an S3 bucket. You also can't enforce a VPC endpoint using a bucket policy.

INCORRECT: "Create an AWS Direct Connect connection and migrate the data straight into Amazon Glacier" is incorrect as this is not the most cost-effective option and takes time to setup.

INCORRECT: "Use AWS Global Accelerator to accelerate upload and optimize usage of the available bandwidth" is incorrect as this service is not used for accelerating or optimizing the upload of data from on-premises networks.

17. Question

A company has refactored a legacy application to run as two microservices using Amazon ECS. The application processes data in two parts and the second part of the process takes longer than the first.

How can a solutions architect integrate the microservices and allow them to scale independently?

1: Implement code in microservice 1 to send data to an Amazon S3 bucket. Use S3 event notifications to invoke microservice 2

2: Implement code in microservice 1 to publish data to an Amazon SNS topic. Implement code in microservice 2 to subscribe to this topic

3: Implement code in microservice 1 to send data to Amazon Kinesis Data Firehose. Implement code in microservice 2 to read from Kinesis Data Firehose

4: Implement code in microservice 1 to send data to an Amazon SQS queue. Implement code in microservice 2 to process messages from the queue

Answer: 4

Explanation:

This is a good use case for Amazon SQS. The microservices must be decoupled so they can scale independently. An Amazon SQS queue will enable microservice 1 to add messages to the queue. Microservice 2 can then pick up the messages and process them. This ensures that if there's a spike in traffic on the frontend, messages do not get lost due to the backend process not being ready to process them.

CORRECT: "Implement code in microservice 1 to send data to an Amazon SQS queue. Implement code in microservice 2 to process messages from the queue" is the correct answer.

INCORRECT: "Implement code in microservice 1 to send data to an Amazon S3 bucket. Use S3 event notifications to invoke microservice 2" is incorrect as a message queue would be preferable to an S3 bucket.

INCORRECT: "Implement code in microservice 1 to publish data to an Amazon SNS topic. Implement code in microservice 2 to subscribe to this topic" is incorrect as notifications to topics are pushed to subscribers. In this case we want the second microservice to pickup the messages when ready (pull them).

INCORRECT: "Implement code in microservice 1 to send data to Amazon Kinesis Data Firehose. Implement code in microservice 2 to read from Kinesis Data Firehose" is incorrect as this is not how Firehose works. Firehose sends data directly to destinations, it is not a message queue.

18. Question

A solutions architect is designing a two-tier web application. The application consists of a public-facing web tier hosted on Amazon EC2 in public subnets. The database tier consists of Microsoft SQL Server running on Amazon EC2 in a private subnet. Security is a high priority for the company.

How should security groups be configured in this situation? (Select TWO)

1: Configure the security group for the web tier to allow inbound traffic on port 443 from 0.0.0.0/0

2: Configure the security group for the web tier to allow outbound traffic on port 443 from 0.0.0.0/0

3: Configure the security group for the database tier to allow inbound traffic on port 1433 from the security group for the web tier

4: Configure the security group for the database tier to allow outbound traffic on ports 443 and 1433 to the security group for the web tier

5: Configure the security group for the database tier to allow inbound traffic on ports 443 and 1433 from the security group for the web tier

Answer: 1, 3

Explanation:

In this scenario an inbound rule is required to allow traffic from any internet client to the web front end on SSL/TLS port 443. The source should therefore be set to 0.0.0.0/0 to allow any inbound traffic.

To secure the connection from the web frontend to the database tier, an outbound rule should be created from the public EC2 security group with a destination of the private EC2 security group. The port should be set to 1433 for MySQL. The private EC2 security group will also need to allow inbound traffic on 1433 from the public EC2 security group.

CORRECT: "Configure the security group for the web tier to allow inbound traffic on port 443 from 0.0.0.0/0" is a correct answer.

CORRECT: "Configure the security group for the database tier to allow inbound traffic on port 1433 from the security group for the web tier" is also a correct answer.

INCORRECT: "Configure the security group for the web tier to allow outbound traffic on port 443 from 0.0.0.0/0" is incorrect as this is configured

backwards.

INCORRECT: "Configure the security group for the database tier to allow outbound traffic on ports 443 and 1433 to the security group for the web tier" is incorrect as the MySQL database instance does not need to send outbound traffic on either of these ports.

INCORRECT: "Configure the security group for the database tier to allow inbound traffic on ports 443 and 1433 from the security group for the web tier" is incorrect as the database tier does not need to allow inbound traffic on port 443.

19. Question

A solutions architect has created a new AWS account and must secure AWS account root user access.

Which combination of actions will accomplish this? (Select TWO)

1: Ensure the root user uses a strong password

2: Enable multi-factor authentication to the root user

3: Store root user access keys in an encrypted Amazon S3 bucket

4: Add the root user to a group containing administrative permissions

5: Delete the root user account

Answer: 1, 2

Explanation:

There are several security best practices for securing the root user account:

- Lock away root user access keys OR delete them if possible
- Use a strong password
- Enable multi-factor authentication (MFA)

The root user automatically has full privileges to the account and these privileges cannot be restricted so it is extremely important to follow best practice advice about securing the root user account.

CORRECT: "Ensure the root user uses a strong password" is the correct answer.

CORRECT: "Enable multi-factor authentication to the root user" is the correct answer.

INCORRECT: "Store root user access keys in an encrypted Amazon S3 bucket" is incorrect as the best practice is to lock away or delete the root user

access keys. An S3 bucket is not a suitable location for storing them, even if encrypted.

INCORRECT: "Add the root user to a group containing administrative permissions" is incorrect as this does not restrict access and is unnecessary.

INCORRECT: "Delete the root user account" is incorrect as you cannot delete the root user account.

20. Question

A company allows its developers to attach existing IAM policies to existing IAM roles to enable faster experimentation and agility. However, the security operations team is concerned that the developers could attach the existing administrator policy, which would allow the developers to circumvent any other security policies.

How should a solutions architect address this issue?

1: Create an Amazon SNS topic to send an alert every time a developer creates a new policy

2: Use service control policies to disable IAM activity across all accounts in the organizational unit

3: Prevent the developers from attaching any policies and assign all IAM duties to the security operations team

4: Set an IAM permissions boundary on the developer IAM role that explicitly denies attaching the administrator policy

Answer: 4

Explanation:

The permissions boundary for an IAM entity (user or role) sets the maximum permissions that the entity can have. This can change the effective permissions for that user or role. The effective permissions for an entity are the permissions that are granted by all the policies that affect the user or role. Within an account, the permissions for an entity can be affected by identity-based policies, resource-based policies, permissions boundaries, Organizations SCPs, or session policies.

Therefore, the solutions architect can set an IAM permissions boundary on the developer IAM role that explicitly denies attaching the administrator policy.

CORRECT: "Set an IAM permissions boundary on the developer IAM role that explicitly denies attaching the administrator policy" is the correct answer.

INCORRECT: "Create an Amazon SNS topic to send an alert every time a developer creates a new policy" is incorrect as this would mean investigating every incident which is not an efficient solution.

INCORRECT: "Use service control policies to disable IAM activity across all accounts in the organizational unit" is incorrect as this would prevent the developers from being able to work with IAM completely.

INCORRECT: "Prevent the developers from attaching any policies and assign all IAM duties to the security operations team" is incorrect as this is not necessary. The requirement is to allow developers to work with policies, the solution needs to find a secure way of achieving this.

21. Question

A solutions architect is optimizing a website for real-time streaming and on-demand videos. The website's users are located around the world and the solutions architect needs to optimize the performance for both the real-time and on-demand streaming.

Which service should the solutions architect choose?

1: Amazon CloudFront

2: AWS Global Accelerator

3: Amazon Route 53

4: Amazon S3 Transfer Acceleration

Answer: 1

Explanation:

Amazon CloudFront can be used to stream video to users across the globe using a wide variety of protocols that are layered on top of HTTP. This can include both on-demand video as well as real time streaming video.

CORRECT: "Amazon CloudFront" is the correct answer.

INCORRECT: "AWS Global Accelerator" is incorrect as this would be an expensive way of getting the content closer to users compared to using CloudFront. As this is a use case for CloudFront and there are so many edge locations it is the better option.

INCORRECT: "Amazon Route 53" is incorrect as you still need a solution for getting the content closer to users.

INCORRECT: "Amazon S3 Transfer Acceleration" is incorrect as this is used to accelerate uploads of data to Amazon S3 buckets.

22. Question

An organization is creating a new storage solution and needs to ensure that Amazon S3 objects that are deleted are immediately restorable for up to 30 days. After 30 days the objects should be retained for a further 180 days and be restorable within 24 hours.

The solution should be operationally simple and cost-effective. How can these requirements be achieved? (Select TWO)

1: Enable object versioning on the Amazon S3 bucket that will contain the objects

3: Create a lifecycle rule to transition non-current versions to GLACIER after 30 days, and then expire the objects after 180 days

3: Enable multi-factor authentication (MFA) delete protection

4: Enable cross-region replication (CRR) for the Amazon S3 bucket that will contain the objects

5: Create a lifecycle rule to transition non-current versions to STANDARD_IA after 30 days, and then expire the objects after 180 days

Answer: 1,2

Explanation:

Object Versioning is a means of keeping multiple variants of an object in the same Amazon S3 bucket. When you delete an object in a versioning enabled bucket the object is not deleted, a delete marker is added and the object is considered “non-current”. In this case we can then transition the non-current versions to GLACIER after 30 days (as we need immediate recoverability for 30 days), and then expire the object after 180 days as they are no longer required to be recoverable.

CORRECT: "Enable object versioning on the Amazon S3 bucket that will contain the objects" is the correct answer.

CORRECT: "Create a lifecycle rule to transition non-current versions to GLACIER after 30 days, and then expire the objects after 180 days" is the correct answer.

INCORRECT: "Enable multi-factor authentication (MFA) delete protection" is incorrect. Multi-factor authentication (MFA) delete is a way of adding an extra layer of security to prevent accidental deletion. That's not what we're looking to do here. We don't want to add any additional operational elements, we just need the ability to restore if we accidentally delete something.

INCORRECT: "Enable cross-region replication (CRR) for the Amazon S3 bucket that will contain the objects" is incorrect. Cross-region replication (CRR) is used for replicating the entire bucket to another region. This provide disaster recovery and a full additional copy of data. This is not the most cost-effective solution as you have 2 full copies of your data. However, deletions are not replicated so it does provide protection from deleting objects.

INCORRECT: "Create a lifecycle rule to transition non-current versions to STANDARD_IA after 30 days, and then expire the objects after 180 days" is incorrect. Transitioning to STANDARD_IA is less cost-effective than transitioning to GLACIER. As we only need recoverability within 24 hours GLACIER is the best option.

23. Question

Objects uploaded to Amazon S3 are initially accessed frequently for a period of 30 days. Then, objects are infrequently accessed for up to 90 days. After that, the objects are no longer needed.

How should lifecycle management be configured?

1: Transition to STANDARD_IA after 30 days. After 90 days transition to GLACIER

2: Transition to STANDARD_IA after 30 days. After 90 days transition to ONEZONE_IA

3: Transition to ONEZONE_IA after 30 days. After 90 days expire the objects

4: Transition to REDUCED_REDUNDANCY after 30 days. After 90 days expire the objects

Answer: 3

Explanation:

In this scenario we need to keep the objects in the STANDARD storage class for 30 days as the objects are being frequently accessed. We can configure a lifecycle action that then transitions the objects to INTELLIGENT_TIERING, STANDARD_IA, or ONEZONE_IA. After that we don't need the objects so they can be expired.

All other options do not meet the stated requirements or are not supported lifecycle transitions. For example:

- You cannot transition to REDUCED_REDUNDANCY from any storage class.
- Transitioning from STANDARD_IA to ONEZONE_IA is possible but we do not want to keep the objects so it incurs unnecessary costs.
- Transitioning to GLACIER is possible but again incurs unnecessary costs.

CORRECT: "Transition to ONEZONE_IA after 30 days. After 90 days expire the objects " is the correct answer.

INCORRECT: "Transition to STANDARD_IA after 30 days. After 90 days transition to GLACIER" is incorrect.

INCORRECT: "Transition to STANDARD_IA after 30 days. After 90 days transition to ONEZONE_IA" is incorrect.

INCORRECT: "Transition to REDUCED_REDUNDANCY after 30 days. After 90 days expire the objects " is incorrect.

24. Question

A company has acquired another business and needs to migrate their 50TB of data into AWS within 1 month. They also require a secure, reliable and private connection to the AWS cloud.

How are these requirements best accomplished?

1: Provision an AWS Direct Connect connection and migrate the data over the link

2: Migrate data using AWS Snowball. Provision an AWS VPN initially and order a Direct Connect link

3: Launch a Virtual Private Gateway (VPG) and migrate the data over the AWS VPN

4: Provision an AWS VPN CloudHub connection and migrate the data over redundant links

Answer: 2

Explanation:

AWS Direct Connect provides a secure, reliable and private connection. However, lead times are often longer than 1 month so it cannot be used to migrate data within the timeframes. Therefore, it is better to use AWS Snowball to move the data and order a Direct Connect connection to satisfy the other requirement later on. In the meantime the organization can use an AWS VPN for secure, private access to their VPC.

CORRECT: "Migrate data using AWS Snowball. Provision an AWS VPN initially and order a Direct Connect link" is the correct answer.

INCORRECT: "Provision an AWS Direct Connect connection and migrate the data over the link" is incorrect due to the lead time for installation.

INCORRECT: "Launch a Virtual Private Gateway (VPG) and migrate the data over the AWS VPN" is incorrect. A VPG is the AWS-side of an AWS VPN. A VPN does not provide a private connection and is not reliable as you can never guarantee the latency over the Internet

INCORRECT: "Provision an AWS VPN CloudHub connection and migrate the data over redundant links" is incorrect. AWS VPN CloudHub is a service for connecting multiple sites into your VPC over VPN connections. It is not used for aggregating links and the limitations of Internet bandwidth from the company where the data is stored will still be an issue. It also uses the public Internet so is not a private or reliable connection.

25. Question

An application on Amazon Elastic Container Service (ECS) performs data processing in two parts. The second part takes much longer to complete. How can an Architect decouple the data processing from the backend application component?

1: Process both parts using the same ECS task. Create an Amazon Kinesis Firehose stream

2: Process each part using a separate ECS task. Create an Amazon SNS topic and send a notification when the processing completes

3: Create an Amazon DynamoDB table and save the output of the first part to the table

4: Process each part using a separate ECS task. Create an Amazon SQS queue

Answer: 4

Explanation:

Processing each part using a separate ECS task may not be essential but means you can separate the processing of the data. An Amazon Simple Queue Service (SQS) is used for decoupling applications. It is a message queue on which you place messages for processing by application components. In this case you can process each data processing part in separate ECS tasks and have them write an Amazon SQS queue. That way the backend can pick up the messages from the queue when they're ready and there is no delay due to the second part not being complete.

CORRECT: "Process each part using a separate ECS task. Create an Amazon SQS queue" is the correct answer.

INCORRECT: "Process both parts using the same ECS task. Create an Amazon Kinesis Firehose stream" is incorrect. Amazon Kinesis Firehose is used for streaming data. This is not an example of streaming data. In this case SQS is better as a message can be placed on a queue to indicate that the job is complete and ready to be picked up by the backend application component.

INCORRECT: "Process each part using a separate ECS task. Create an Amazon SNS topic and send a notification when the processing completes" is incorrect. Amazon Simple Notification Service (SNS) can be used for sending notifications. It is useful when you need to notify multiple AWS services. In this case an Amazon SQS queue is a better solution as there is no mention of multiple AWS services and this is an ideal use case for SQS.

INCORRECT: "Create an Amazon DynamoDB table and save the output of the first part to the table" is incorrect. Amazon DynamoDB is unlikely to be a good solution for this requirement. There is a limit on the maximum amount of data that you can store in an entry in a DynamoDB table.

26. Question

An application is running on Amazon EC2 behind an Elastic Load Balancer (ELB). Content is being published using Amazon CloudFront

and you need to restrict the ability for users to circumvent CloudFront and access the content directly through the ELB.

How can you configure this solution?

1: Create an Origin Access Identity (OAI) and associate it with the distribution

2: Use signed URLs or signed cookies to limit access to the content

3: Use a Network ACL to restrict access to the ELB

4: Create a VPC Security Group for the ELB and use AWS Lambda to automatically update the CloudFront internal service IP addresses when they change

Answer: 4

Explanation:

The only way to get this working is by using a VPC Security Group for the ELB that is configured to allow only the internal service IP ranges associated with CloudFront. As these are updated from time to time, you can use AWS Lambda to automatically update the addresses. This is done using a trigger that is triggered when AWS issues an SNS topic update when the addresses are changed.

CORRECT: "Create a VPC Security Group for the ELB and use AWS Lambda to automatically update the CloudFront internal service IP addresses when they change" is the correct answer.

INCORRECT: "Create an Origin Access Identity (OAI) and associate it with the distribution" is incorrect. You can use an OAI to restrict access to content in Amazon S3 but not on EC2 or ELB.

INCORRECT: "Use signed URLs or signed cookies to limit access to the content" is incorrect. Signed cookies and URLs are used to limit access to files but this does not stop people from circumventing CloudFront and accessing the ELB directly.

INCORRECT: "Use a Network ACL to restrict access to the ELB" is incorrect. A Network ACL can be used to restrict access to an ELB but it is recommended to use security groups and this solution is incomplete as it does not account for the fact that the internal service IP ranges change over time.

27. Question

A company has divested a single business unit and needs to move the AWS account owned by the business unit to another AWS Organization. How can this be achieved?

1: Create a new account in the destination AWS Organization and migrate resources

2: Create a new account in the destination AWS Organization and share the original resources using AWS Resource Access Manager

3: Migrate the account using AWS CloudFormation

4: Migrate the account using the AWS Organizations console

Answer: 4

Explanation:

Accounts can be migrated between organizations. To do this you must have root or IAM access to both the member and master accounts. Resources will remain under the control of the migrated account.

CORRECT: "Migrate the account using the AWS Organizations console" is the correct answer.

INCORRECT: "Create a new account in the destination AWS Organization and migrate resources" is incorrect. You do not need to create a new account in the destination AWS Organization as you can just migrate the existing account.

INCORRECT: "Create a new account in the destination AWS Organization and share the original resources using AWS Resource Access Manager" is incorrect. You do not need to create a new account in the destination AWS Organization as you can just migrate the existing account.

INCORRECT: "Migrate the account using AWS CloudFormation" is incorrect. You do not need to use AWS CloudFormation. You can use the Organizations API or AWS CLI for when there are many accounts to migrate and therefore you could use CloudFormation for any additional automation but it is not necessary for this scenario.

28. Question

An application running on Amazon EC2 needs to regularly download large objects from Amazon S3. How can performance be optimized for high-throughput use cases?

1: Issue parallel requests and use byte-range fetches

2: Use Amazon S3 Transfer acceleration
3: Use Amazon CloudFront to cache the content
4: Use AWS Global Accelerator

Answer: 1

Explanation:

Using the Range HTTP header in a GET Object request, you can fetch a byte-range from an object, transferring only the specified portion. You can use concurrent connections to Amazon S3 to fetch different byte ranges from within the same object. This helps you achieve higher aggregate throughput versus a single whole-object request. Fetching smaller ranges of a large object also allows your application to improve retry times when requests are interrupted.

CORRECT: "Issue parallel requests and use byte-range fetches" is the correct answer.

INCORRECT: "Use Amazon S3 Transfer acceleration" is incorrect. Amazon S3 Transfer Acceleration is used for speeding up uploads of data to Amazon S3 by using the CloudFront network. It is not used for downloading data.

INCORRECT: "Use Amazon CloudFront to cache the content" is incorrect. Amazon CloudFront is used for caching content closer to users. In this case the EC2 instance needs to access the data so CloudFront is not a good solution (the edge location used by CloudFront may not be closer than the EC2 instance is to the S3 endpoint.

INCORRECT: "Use AWS Global Accelerator" is incorrect. AWS Global Accelerator is used for improving availability and performance for Amazon EC2 instances or Elastic Load Balancers (ALB and NLB). It is not used for improving Amazon S3 performance.

29. Question

An Amazon RDS PostgreSQL database is configured as Multi-AZ. A solutions architect needs to scale read performance and the solution must be configured for high availability. What is the most cost-effective solution?

1: Create a read replica as a Multi-AZ DB instance
2: Deploy a read replica in a different AZ to the master DB instance

3: Deploy a read replica using Amazon ElastiCache
4: Deploy a read replica in the same AZ as the master DB instance

Answer: 1

Explanation:

You can create a read replica as a Multi-AZ DB instance. Amazon RDS creates a standby of your replica in another Availability Zone for failover support for the replica. Creating your read replica as a Multi-AZ DB instance is independent of whether the source database is a Multi-AZ DB instance.

CORRECT: "Create a read replica as a Multi-AZ DB instance" is the correct answer.

INCORRECT: "Deploy a read replica in a different AZ to the master DB instance" is incorrect as this does not provide high availability for the read replica

INCORRECT: "Deploy a read replica using Amazon ElastiCache" is incorrect as ElastiCache is not used to create read replicas of RDS database.

INCORRECT: "Deploy a read replica in the same AZ as the master DB instance" is incorrect as this solution does not include HA for the read replica.

30. Question

A High Performance Computing (HPC) application will be migrated to AWS. The application requires low network latency and high throughput between nodes and will be deployed in a single AZ.
How should the application be deployed for best inter-node performance?

1: In a partition placement group
2: In a cluster placement group
3: In a spread placement group
4: Behind a Network Load Balancer (NLB)

Answer: 2

Explanation:

A cluster placement group provides low latency and high throughput for instances deployed in a single AZ. It is the best way to provide the performance required for this application.

CORRECT: "In a cluster placement group" is the correct answer.

INCORRECT: "In a partition placement group" is incorrect. A partition placement group is used for grouping instances into logical segments. It provides control and visibility into instance placement but is not the best option for performance.

INCORRECT: "In a spread placement group" is incorrect. A spread placement group is used to spread instances across underlying hardware. It is not the best option for performance.

INCORRECT: "Behind a Network Load Balancer (NLB)" is incorrect. A network load balancer is used for distributing incoming connections, this does assist with inter-node performance.

31. Question

A web application is deployed in multiple regions behind an ELB Application Load Balancer. You need deterministic routing to the closest region and automatic failover. Traffic should traverse the AWS global network for consistent performance.

How can this be achieved?

1: Configure AWS Global Accelerator and configure the ALBs as targets

2: Place an EC2 Proxy in front of the ALB and configure automatic failover

3: Create a Route 53 Alias record for each ALB and configure a latency-based routing policy

4: Use a CloudFront distribution with multiple custom origins in each region and configure for high availability

Answer: 1

Explanation:

AWS Global Accelerator is a service that improves the availability and performance of applications with local or global users. You can configure the ALB as a target and Global Accelerator will automatically route users to the closest point of presence.

Failover is automatic and does not rely on any client side cache changes as the IP addresses for Global Accelerator are static anycast addresses. Global

Accelerator also uses the AWS global network which ensures consistent performance.

CORRECT: "Configure AWS Global Accelerator and configure the ALBs as targets" is the correct answer.

INCORRECT: "Place an EC2 Proxy in front of the ALB and configure automatic failover" is incorrect. Placing an EC2 proxy in front of the ALB does not meet the requirements. This solution does not ensure deterministic routing the closest region and failover is happening within a region which does not protect against regional failure. Also, this introduces a potential bottleneck and lack of redundancy.

INCORRECT: "Create a Route 53 Alias record for each ALB and configure a latency-based routing policy" is incorrect. A Route 53 Alias record for each ALB with latency-based routing does provide routing based on latency and failover. However, the traffic will not traverse the AWS global network.

INCORRECT: "Use a CloudFront distribution with multiple custom origins in each region and configure for high availability" is incorrect. You can use CloudFront with multiple custom origins and configure for HA. However, the traffic will not traverse the AWS global network.

32. Question

You are looking for a method to distribute onboarding videos to your company's numerous remote workers around the world. The training videos are located in an S3 bucket that is not publicly accessible. Which of the options below would allow you to share the videos?

1: Use CloudFront and set the S3 bucket as an origin

2: Use a Route 53 Alias record the points to the S3 bucket

3: Use ElastiCache and attach the S3 bucket as a cache origin

4: Use CloudFront and use a custom origin pointing to an EC2 instance

Answer: 1

Explanation:

CloudFront uses origins which specify the origin of the files that the CDN will distribute. Origins can be either an S3 bucket, an EC2 instance, and Elastic Load Balancer, or Route 53 – can also be external (non-AWS). When

using Amazon S3 as an origin you place all of your objects within the bucket.

CORRECT: "Use CloudFront and set the S3 bucket as an origin" is the correct answer.

INCORRECT: "Use a Route 53 Alias record the points to the S3 bucket" is incorrect. You cannot use a Route 53 Alias record to connect to an S3 bucket that is not publicly available.

INCORRECT: "Use ElastiCache and attach the S3 bucket as a cache origin" is incorrect. You cannot configure an origin with ElastiCache.

INCORRECT: "Use CloudFront and use a custom origin pointing to an EC2 instance" is incorrect. You can configure a custom origin pointing to an EC2 instance but as the training videos are located in an S3 bucket this would not be helpful.

33. Question

A client is in the design phase of developing an application that will process orders for their online ticketing system. The application will use a number of front-end EC2 instances that pick-up orders and place them in a queue for processing by another set of back-end EC2 instances. The client will have multiple options for customers to choose the level of service they want to pay for.

The client has asked how he can design the application to process the orders in a prioritized way based on the level of service the customer has chosen?

1: Create multiple SQS queues, configure exactly-once processing and set the maximum visibility timeout to 12 hours

2: Create multiple SQS queues, configure the front-end application to place orders onto a specific queue based on the level of service requested and configure the back-end instances to sequentially poll the queues in order of priority

3: Create a combination of FIFO queues and Standard queues and configure the applications to place messages into the relevant queue based on priority

4: Create a single SQS queue, configure the front-end application to place orders on the queue in order of priority and configure the back-end instances to poll the queue and pick up messages in the order they are presented

Answer: 2

Explanation:

The best option is to create multiple queues and configure the application to place orders onto a specific queue based on the level of service. You then configure the back-end instances to poll these queues in order or priority so they pick up the higher priority jobs first.

CORRECT: "Create multiple SQS queues, configure the front-end application to place orders onto a specific queue based on the level of service requested and configure the back-end instances to sequentially poll the queues in order of priority" is the correct answer.

INCORRECT: "Create multiple SQS queues, configure exactly-once processing and set the maximum visibility timeout to 12 hours" is incorrect. Creating multiple SQS queues and configuring exactly-once processing (only possible with FIFO) would not ensure that the order of the messages is prioritized.

INCORRECT: "Create a combination of FIFO queues and Standard queues and configure the applications to place messages into the relevant queue based on priority" is incorrect as creating a mixture of queue types is not the best way to separate the messages, and there is nothing in this option that explains how the messages would be picked up in the right order.

INCORRECT: "Create a single SQS queue, configure the front-end application to place orders on the queue in order of priority and configure the back-end instances to poll the queue and pick up messages in the order they are presented" is incorrect. This would not work as standard queues offer best-effort ordering so there’s no guarantee that the messages would be picked up in the correct order.

34. Question

Your company is opening a new office in the Asia Pacific region. Users in the new office will need to read data from an RDS database that is hosted in the U.S. To improve performance, you are planning to implement a Read Replica of the database in the Asia Pacific region. However, your Chief Security Officer (CSO) has explained to you that the company policy dictates that all data that leaves the U.S must be encrypted at rest. The master RDS DB is not currently encrypted. What options are available to you? (Select TWO)

1: You can create an encrypted Read Replica that is encrypted with the same key

2: You can create an encrypted Read Replica that is encrypted with a different key

3: You can enable encryption for the master DB by creating a new DB from a snapshot with encryption enabled

4: You can enable encryption for the master DB through the management console

5: You can use an ELB to provide an encrypted transport layer in front of the RDS DB

Answer: 2,3

Explanation:

You can encrypt your Amazon RDS instances and snapshots at rest by enabling the encryption option for your Amazon RDS DB instance when you create it. However, you cannot encrypt an existing DB, you need to create a snapshot, copy it, encrypt the copy, then build an encrypted DB from the snapshot.

Data that is encrypted at rest includes the underlying storage for a DB instance, its automated backups, Read Replicas, and snapshots.

A Read Replica of an Amazon RDS encrypted instance is also encrypted using the same key as the master instance when both are in the same Region. When in different Regions, a different key can be used.

CORRECT: "You can create an encrypted Read Replica that is encrypted with a different key" is the correct answer.

CORRECT: "You can enable encryption for the master DB by creating a new DB from a snapshot with encryption enabled" is the correct answer.

INCORRECT: "You can create an encrypted Read Replica that is encrypted with the same key" is incorrect. If the master and Read Replica are in different regions, you encrypt using the encryption key for that region.

INCORRECT: "You can enable encryption for the master DB through the management console" is incorrect as you can only enable encryption when you first create the database.

INCORRECT: "You can use an ELB to provide an encrypted transport layer in front of the RDS DB" is incorrect as ELBs are not placed in front of RDS instances, they are placed in front of EC2 instances.

35. Question

A company's Amazon EC2 instances were terminated or stopped, resulting in a loss of important data that was stored on attached EC2 instance stores. They want to avoid this happening in the future and need a solution that can scale as data volumes increase with the LEAST amount of management and configuration.

Which storage is most appropriate?

1: Amazon EFS

2: Amazon S3

3: Amazon EBS

4: Amazon RDS

Answer: 1

Explanation:

Amazon EFS is a fully managed service that requires no changes to your existing applications and tools, providing access through a standard file system interface for seamless integration. It is built to scale on demand to petabytes without disrupting applications, growing and shrinking automatically as you add and remove files. This is an easy solution to implement and the option that requires the least management and configuration.

An instance store provides temporary block-level storage for an EC2 instance. If you terminate the instance you lose all data. The alternative is to use Elastic Block Store volumes which are also block-level storage devices but the data is persistent. However, EBS is not a fully managed solution and doesn't grow automatically as your data requirements increase – you would need to increase the volume size and then extend your filesystem.

CORRECT: "Amazon EFS" is the correct answer.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 is an object storage solution and as the data is currently sitting on a block storage you would need to develop some way to use the REST API to upload/manage data on S3 – this is not the easiest solution to implement.

INCORRECT: "Amazon EBS" is incorrect as EBS is not a fully managed solution and doesn't grow automatically as your data requirements increase

– you would need to increase the volume size and then extend your filesystem.

INCORRECT: "Amazon RDS" is incorrect. Amazon RDS is a relational database service, the question is not looking for a database, just a way of storing data.

36. Question

You would like to grant additional permissions to an individual ECS application container on an ECS cluster that you have deployed. You would like to do this without granting additional permissions to the other containers that are running on the cluster.

How can you achieve this?

1: Create a separate Task Definition for the application container that uses a different Task Role

2: In the same Task Definition, specify a separate Task Role for the application container

3: Use EC2 instances instead as you can assign different IAM roles on each instance

4: You cannot implement granular permissions with ECS containers

Answer: 1

Explanation:

You can only apply one IAM role to a Task Definition so you must create a separate Task Definition. A Task Definition is required to run Docker containers in Amazon ECS and you can specify the IAM role (Task Role) that the task should use for permissions.

With the EC2 launch type you can apply IAM roles at the container and task level, whereas with Fargate you can only apply at the task level.

CORRECT: "Create a separate Task Definition for the application container that uses a different Task Role" is the correct answer.

INCORRECT: "In the same Task Definition, specify a separate Task Role for the application container" is incorrect as int this case a separate task definition should be created to avoid granting the permissions to other containers running on the cluster.

INCORRECT: "Use EC2 instances instead as you can assign different IAM roles on each instance" is incorrect. You can apply different IAM roles to

different EC2 instances, but to grant permissions to ECS application containers you must use Task Definitions and Task Roles.

INCORRECT: "You cannot implement granular permissions with ECS containers" is incorrect. It is incorrect to say that you cannot implement granular permissions with ECS containers as IAM roles are granular and are applied through Task Definitions/Task Roles.

37. Question

The development team in your company has created a new application that you plan to deploy on AWS which runs multiple components in Docker containers. You would prefer to use AWS managed infrastructure for running the containers as you do not want to manage EC2 instances.

Which of the below solution options would deliver these requirements? (Select TWO)

1: Use the Elastic Container Service (ECS) with the Fargate Launch Type

2: Put your container images in a private repository

3: Use the Elastic Container Service (ECS) with the EC2 Launch Type

4: Use CloudFront to deploy Docker on EC2

5: Put your container images in the Elastic Container Registry (ECR)

Answer: 1,5

Explanation:

If you do not want to manage EC2 instances you must use the AWS Fargate launch type which is a serverless infrastructure managed by AWS. Fargate only supports container images hosted on Elastic Container Registry (ECR) or Docker Hub.

CORRECT: "Use the Elastic Container Service (ECS) with the Fargate Launch Type" is the correct answer.

CORRECT: "Put your container images in the Elastic Container Registry (ECR)" is the correct answer.

INCORRECT: "Put your container images in a private repository" is incorrect. Private repositories are only supported by the EC2 Launch Type. The EC2 Launch Type allows you to run containers on EC2 instances that you manage.

INCORRECT: "Use the Elastic Container Service (ECS) with the EC2 Launch Type" is incorrect

INCORRECT: "Use CloudFront to deploy Docker on EC2" is incorrect. You cannot use CloudFront (a CDN) to deploy Docker on EC2.

38. Question

A developer is creating a solution for a real-time bidding application for a large retail company that allows users to bid on items of end-of-season clothing. The application is expected to be extremely popular and the back-end DynamoDB database may not perform as required.

How can the Solutions Architect enable in-memory read performance with microsecond response times for the DynamoDB database?

1: Enable read replicas

2: Configure DynamoDB Auto Scaling

3: Configure Amazon DAX

4: Increase the provisioned throughput

Answer: 3

Explanation:

Amazon DynamoDB Accelerator (DAX) is a fully managed, highly available, in-memory cache for DynamoDB that delivers up to a 10x performance improvement – from milliseconds to microseconds – even at millions of requests per second. You can enable DAX for a DynamoDB database with a few clicks.

CORRECT: "Configure Amazon DAX" is the correct answer.

INCORRECT: "Enable read replicas" is incorrect. There is no such thing as read replicas with DynamoDB.

INCORRECT: "Configure DynamoDB Auto Scaling" is incorrect. DynamoDB auto scaling actively manages throughput capacity for tables and global secondary indexes so like provisioned throughput it does not provide the speed or in-memory capabilities requested.

INCORRECT: "Increase the provisioned throughput" is incorrect. Provisioned throughput is the maximum amount of capacity that an application can consume from a table or index, it doesn't improve the speed of the database or add in-memory capabilities.

39. Question

An application launched on Amazon EC2 instances needs to publish personally identifiable information (PII) about customers using Amazon SNS. The application is launched in private subnets within an Amazon VPC.

Which is the MOST secure way to allow the application to access service endpoints in the same region?

1: Use an Internet Gateway

2: Use AWS PrivateLink

3: Use a proxy instance

4: Use a NAT gateway

Answer: 2

Explanation:

To publish messages to Amazon SNS topics from an Amazon VPC, create an interface VPC endpoint. Then, you can publish messages to SNS topics while keeping the traffic within the network that you manage with the VPC. This is the most secure option as traffic does not need to traverse the Internet.

CORRECT: "Use AWS PrivateLink" is the correct answer.

INCORRECT: "Use an Internet Gateway" is incorrect. Internet Gateways are used by instances in public subnets to access the Internet and this is less secure than an VPC endpoint.

INCORRECT: "Use a proxy instance" is incorrect. A proxy instance will also use the public Internet and so is less secure than a VPC endpoint.

INCORRECT: "Use a NAT gateway" is incorrect. A NAT Gateway is used by instances in private subnets to access the Internet and this is less secure than an VPC endpoint.

40. Question

A mobile client requires data from several application-layer services to populate its user interface. What can the application team use to decouple the client interface from the underlying services behind them?

1: AWS Device Farm

2: Amazon Cognito
3: Amazon API Gateway
4: Application Load Balancer

Answer: 3

Explanation:

Amazon API Gateway decouples the client application from the back-end application-layer services by providing a single endpoint for API requests.

CORRECT: "Amazon API Gateway" is the correct answer.

INCORRECT: "AWS Device Farm" is incorrect. AWS Device farm is an app testing service for Android, iOS and web apps.

INCORRECT: "Amazon Cognito" is incorrect. Amazon Cognito is used for adding sign-up, sign-in and access control to mobile apps.

INCORRECT: "Application Load Balancer" is incorrect. An application load balancer distributes incoming connection requests to back-end EC2 instances. It is not used for decoupling application-layer services from mobile clients.

41. Question

A Solutions Architect is designing a web application that runs on Amazon EC2 instances behind an Elastic Load Balancer. All data in transit must be encrypted.

Which solution options meet the encryption requirement? (Select TWO)

1: Use a Network Load Balancer (NLB) with a TCP listener, then terminate SSL on EC2 instances

2: Use an Application Load Balancer (ALB) with an HTTPS listener, then install SSL certificates on the ALB and EC2 instances

3: Use an Application Load Balancer (ALB) in passthrough mode, then terminate SSL on EC2 instances

4: Use a Network Load Balancer (NLB) with an HTTPS listener, then install SSL certificates on the NLB and EC2 instances

5: Use an Application Load Balancer (ALB) with a TCP listener, then terminate SSL on EC2 instances

Answer: 1,2

Explanation:

You can passthrough encrypted traffic with an NLB and terminate the SSL on the EC2 instances, so this is a valid answer.

You can use a HTTPS listener with an ALB and install certificates on both the ALB and EC2 instances. This does not use passthrough, instead it will terminate the first SSL connection on the ALB and then re-encrypt the traffic and connect to the EC2 instances.

CORRECT: "Use a Network Load Balancer (NLB) with a TCP listener, then terminate SSL on EC2 instances" is the correct answer.

CORRECT: "Use an Application Load Balancer (ALB) with an HTTPS listener, then install SSL certificates on the ALB and EC2 instances" is the correct answer.

INCORRECT: "Use an Application Load Balancer (ALB) in passthrough mode, then terminate SSL on EC2 instances" is incorrect. You cannot use passthrough mode with an ALB and terminate SSL on the EC2 instances.

INCORRECT: "Use a Network Load Balancer (NLB) with an HTTPS listener, then install SSL certificates on the NLB and EC2 instances" is incorrect. You cannot use a HTTPS listener with an NLB.

INCORRECT: "Use an Application Load Balancer (ALB) with a TCP listener, then terminate SSL on EC2 instances" is incorrect. You cannot use a TCP listener with an ALB.

42. Question

An application running video-editing software is using significant memory on an Amazon EC2 instance. How can a user track memory usage on the Amazon EC2 instance?

1: Install the CloudWatch agent on the EC2 instance to push memory usage to an Amazon CloudWatch custom metric

2: Use an instance type that supports memory usage reporting to a metric by default

3: Call Amazon CloudWatch to retrieve the memory usage metric data that exists for the EC2 instance

4: Assign an IAM role to the EC2 instance with an IAM policy granting access to the desired metric

Answer: 1

Explanation:

There is no standard metric in CloudWatch for collecting EC2 memory usage. However, you can use the CloudWatch agent to collect both system metrics and log files from Amazon EC2 instances and on-premises servers. The metrics can be pushed to a CloudWatch custom metric.

CORRECT: "Install the CloudWatch agent on the EC2 instance to push memory usage to an Amazon CloudWatch custom metric" is the correct answer.

INCORRECT: "Use an instance type that supports memory usage reporting to a metric by default" is incorrect. There is no such thing as an EC2 instance type that supports memory usage reporting to a metric by default. The limitation is not in EC2 but in the metrics that are collected by CloudWatch.

INCORRECT: "Call Amazon CloudWatch to retrieve the memory usage metric data that exists for the EC2 instance" is incorrect. As there is no standard metric for collecting EC2 memory usage in CloudWatch the data will not already exist there to be retrieved.

INCORRECT: "Assign an IAM role to the EC2 instance with an IAM policy granting access to the desired metric" is incorrect. This is not an issue of permissions.

43. Question

A company hosts a popular web application that connects to an Amazon RDS MySQL DB instance running in a private VPC subnet that was created with default ACL settings. The web servers must be accessible only to customers on an SSL connection. The database should only be accessible to web servers in a public subnet.

Which solution meets these requirements without impacting other running applications? (Select TWO)

1: Create a DB server security group that allows MySQL port 3306 inbound and specify the source as a web server security group

2: Create a web server security group that allows HTTPS port 443 inbound traffic from Anywhere (0.0.0.0/0) and apply it to the web servers

3: Create a network ACL on the web server's subnet, allow HTTPS port 443 inbound, and specify the source as 0.0.0.0/0

4: Create a DB server security group that allows the HTTPS port 443 inbound and specify the source as a web server security group

5: Create a network ACL on the DB subnet, allow MySQL port 3306 inbound for web servers, and deny all outbound traffic

Answer: 1,2

Explanation:

A VPC automatically comes with a modifiable default network ACL. By default, it allows all inbound and outbound IPv4 traffic. Custom network ACLs deny everything inbound and outbound by default but in this case a default network ACL is being used.

Inbound connections to web servers will be coming in on port 443 from the Internet so creating a security group to allow this port from 0.0.0.0/0 and applying it to the web servers will allow this traffic.

CORRECT: "Create a DB server security group that allows MySQL port 3306 inbound and specify the source as a web server security group" is the correct answer.

CORRECT: "Create a web server security group that allows HTTPS port 443 inbound traffic from Anywhere (0.0.0.0/0) and apply it to the web servers" is the correct answer.

INCORRECT: "Create a network ACL on the web server's subnet, allow HTTPS port 443 inbound, and specify the source as 0.0.0.0/0" is incorrect as a default network ACL will already allow this traffic.

INCORRECT: "Create a DB server security group that allows the HTTPS port 443 inbound and specify the source as a web server security group" is incorrect. The MySQL DB will be listening on port 3306. Therefore, the security group that is applied to the DB servers should allow 3306 inbound from the web servers security group.

INCORRECT: "Create a network ACL on the DB subnet, allow MySQL port 3306 inbound for web servers, and deny all outbound traffic" is incorrect as a default network ACL will already allow this traffic.

44. Question

The security team in your company is defining new policies for enabling security analysis, resource change tracking, and compliance auditing. They would like to gain visibility into user activity by recording API

calls made within the company's AWS account. The information that is logged must be encrypted. This requirement applies to all AWS regions in which your company has services running.

How will you implement this request? (Select TWO)

1: Create a CloudTrail trail in each region in which you have services

2: Enable encryption with a single KMS key

3: Create a CloudTrail trail and apply it to all regions

4: Enable encryption with multiple KMS keys

5: Use CloudWatch to monitor API calls

Answer: 2,3

Explanation:

CloudTrail is used for recording API calls (auditing) whereas CloudWatch is used for recording metrics (performance monitoring). The solution can be deployed with a single trail that is applied to all regions. A single KMS key can be used to encrypt log files for trails applied to all regions. CloudTrail log files are encrypted using S3 Server Side Encryption (SSE) and you can also enable encryption SSE KMS for additional security.

CORRECT: "Enable encryption with a single KMS key" is the correct answer.

CORRECT: "Create a CloudTrail trail and apply it to all regions" is the correct answer.

INCORRECT: "Create a CloudTrail trail in each region in which you have services" is incorrect. You do not need to create a separate trail in each region.

INCORRECT: "Enable encryption with multiple KMS keys" is incorrect. You do not need to use multiple KMS keys.

INCORRECT: "Use CloudWatch to monitor API calls" is incorrect. CloudWatch is not used for monitoring API calls (use CloudTrail).

45. Question

An organization is migrating data to the AWS cloud. An on-premises application uses Network File System shares and must access the data without code changes. The data is critical and is accessed frequently.

Which storage solution should a Solutions Architect recommend to maximize availability and durability?

1: Amazon Elastic Block Store

2: Amazon Simple Storage Service

3: AWS Storage Gateway – File Gateway

4: Amazon Elastic File System

Answer: 3

Explanation:

The solution must use NFS file shares to access the migrated data without code modification. This means you can use either Amazon EFS or AWS Storage Gateway – File Gateway. Both of these can be mounted using NFS from on-premises applications.

However, EFS is the wrong answer as the solution asks to maximize availability and durability. The File Gateway backs off of Amazon S3 which has much higher availability and durability than EFS which is why it is the best solution for this scenario.

CORRECT: "AWS Storage Gateway – File Gateway" is the correct answer.

INCORRECT: "Amazon Elastic Block Store" is incorrect. Amazon EBS is not a suitable solution as it is a block-based (not file-based like NFS) storage solution that you mount to EC2 instances in the cloud – not from on-premises applications.

INCORRECT: "Amazon Simple Storage Service" is incorrect. Amazon S3 does not offer an NFS interface.

INCORRECT: "Amazon Elastic File System" is incorrect as explained above.

46. Question

A bespoke application consisting of three tiers is being deployed in a VPC. You need to create three security groups. You have configured the WebSG (web server) security group and now need to configure the AppSG (application tier) and DBSG (database tier). The application runs on port 1030 and the database runs on 3306.

Which rules should be created according to security best practice? (Select TWO)

1: On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the AppSG security group as the source

2: On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the WebSG security group as the source

3: On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the DBSG security group as the source

4: On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the WebSG security group as the source

5: On the WebSG security group, create a custom TCP rule for TCP 1030 and configure the AppSG security group as the source

Answer: 1,2

Explanation:

With security groups rules are always allow rules. The best practice is to configure the source as another security group which is attached to the EC2 instances that traffic will come from. In this case you need to configure a rule that allows TCP 1030 and configure the source as the web server security group (WebSG).

This allows traffic from the web servers to reach the application servers. You then need to allow communications on port 3306 (MYSQL/Aurora) from the AppSG security group to enable access to the database from the application servers.

CORRECT: "On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the AppSG security group as the source" is the correct answer.

CORRECT: "On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the WebSG security group as the source" is the correct answer.

INCORRECT: "On the AppSG security group, create a custom TCP rule for TCP 1030 and configure the DBSG security group as the source" is incorrect as the app tier will receive traffic from the web tier.

INCORRECT: "On the DBSG security group, create a custom TCP rule for TCP 3306 and configure the WebSG security group as the source" is incorrect as the databases will be receiving traffic from the app servers.

INCORRECT: "On the WebSG security group, create a custom TCP rule for TCP 1030 and configure the AppSG security group as the source" is

incorrect as the web service will be receiving traffic from internet, presumably on standard HTTP/HTTPS ports. This web server security group has already been configured.

47. Question

A Solutions Architect needs to design a solution that will allow Website Developers to deploy static web content without managing server infrastructure. All web content must be accessed over HTTPS with a custom domain name. The solution should be scalable as the company continues to grow.

Which of the following will provide the MOST cost-effective solution?

1: Amazon S3 with a static website

2: Amazon CloudFront with an Amazon S3 bucket origin

3: AWS Lambda function with Amazon API Gateway

4: Amazon EC2 instance with Amazon EBS

Answer: 2

Explanation:

You can create an Amazon CloudFront distribution that uses an S3 bucket as the origin. This will allow you to serve the static content using the HTTPS protocol.

To serve a static website hosted on Amazon S3, you can deploy a CloudFront distribution using one of these configurations:

- Using a REST API endpoint as the origin with access restricted by an origin access identity (OAI) .
- Using a website endpoint as the origin with anonymous (public) access allowed.
- Using a website endpoint as the origin with access restricted by a Referer header.

CORRECT: "Amazon CloudFront with an Amazon S3 bucket origin" is the correct answer.

INCORRECT: "Amazon S3 with a static website" is incorrect. You can create a static website using Amazon S3 with a custom domain name. However, you cannot connect to an Amazon S3 static website using HTTPS (only HTTP) so this solution does not work.

INCORRECT: "AWS Lambda function with Amazon API Gateway" is incorrect. AWS Lambda and API Gateway are both serverless services however this combination does not provide a solution for serving static content over HTTPS.

INCORRECT: "Amazon EC2 instance with Amazon EBS" is incorrect. Amazon EC2 with EBS is not a suitable solution as you would need to manage the server infrastructure (which the question states is not desired).

48. Question

A Solutions Architect must design a storage solution for incoming billing reports in CSV format. The data will be analyzed infrequently and discarded after 30 days.

Which combination of services will be MOST cost-effective in meeting these requirements?

1: Write the files to an S3 bucket and use Amazon Athena to query the data

2: Import the logs to an Amazon Redshift cluster

3: Use AWS Data Pipeline to import the logs into a DynamoDB table

4: Import the logs into an RDS MySQL instance

Answer: 1

Explanation:

Amazon S3 is great solution for storing objects such as this. You only pay for what you use and don't need to worry about scaling as it will scale as much as you need it to. Using Amazon Athena to analyze the data works well as it is a serverless service so it will be very cost-effective for use cases where the analysis is only happening infrequently. You can also configure Amazon S3 to expire the objects after 30 days.

CORRECT: "Write the files to an S3 bucket and use Amazon Athena to query the data" is the correct answer.

INCORRECT: "Import the logs to an Amazon Redshift cluster" is incorrect. Importing the log files into an Amazon RedShift cluster will mean you can perform analytics on the data as this is the primary use case for RedShift (it's a data warehouse). However, this is not the most cost-effective solution as RedShift uses EC2 instances (it's not serverless) so the instances will be running all the time even though the analytics is infrequent.

INCORRECT: "Use AWS Data Pipeline to import the logs into a DynamoDB table" is incorrect. AWS Data Pipeline is used to process and move data. You can move data into DynamoDB, but this is not a good storage solution for these log files. Also, there is no analytics solution in this option.

INCORRECT: "Import the logs into an RDS MySQL instance" is incorrect. Importing the logs into an RDS MySQL instance is not a good solution. This is not the best storage solution for log files and its main use case as a DB is transactional rather than analytical.

49. Question

A Solutions Architect must design a solution that encrypts data in Amazon S3. Corporate policy mandates encryption keys be generated and managed on premises. Which solution should the Architect use to meet the security requirements?

1: SSE-C: Server-side encryption with customer-provided encryption keys

2: SSE-S3: Server-side encryption with Amazon-managed master key

3: SSE-KMS: Server-side encryption with AWS KMS managed keys

4: AWS CloudHSM

Answer: 1

Explanation:

Server-side encryption is about protecting data at rest. Server-side encryption encrypts only the object data, not object metadata. Using server-side encryption with customer-provided encryption keys (SSE-C) allows you to set your own encryption keys. With the encryption key you provide as part of your request, Amazon S3 manages the encryption as it writes to disks and decryption when you access your objects. Therefore, you don't need to maintain any code to perform data encryption and decryption. The only thing you do is manage the encryption keys you provide.

When you upload an object, Amazon S3 uses the encryption key you provide to apply AES-256 encryption to your data and removes the encryption key from memory. When you retrieve an object, you must provide the same encryption key as part of your request. Amazon S3 first verifies that the encryption key you provided matches and then decrypts the object before returning the object data to you.

CORRECT: "SSE-C: Server-side encryption with customer-provided encryption keys" is the correct answer.

INCORRECT: "SSE-S3: Server-side encryption with Amazon-managed master key" is incorrect. With SSE-S3, Amazon manage the keys for you, so this is incorrect.

INCORRECT: "SSE-KMS: Server-side encryption with AWS KMS managed keys" is incorrect. With SSE-KMS the keys are managed in the Amazon Key Management Service, so this is incorrect.

INCORRECT: "AWS CloudHSM" is incorrect. With AWS CloudHSM your keys are held in AWS in a hardware security module. Again, the keys are not on-premises they are in AWS, so this is incorrect.

50. Question

A Solutions Architect must select the most appropriate database service for two use cases. A team of data scientists perform complex queries on a data warehouse that take several hours to complete. Another team of scientists need to run fast, repeat queries and update dashboards for customer support staff.

Which solution delivers these requirements MOST cost-effectively?

1: RedShift for both use cases

2: RDS for both use cases

3: RedShift for the analytics use case and ElastiCache in front of RedShift for the customer support dashboard

4: RedShift for the analytics use case and RDS for the customer support dashboard

Answer: 1

Explanation:

RedShift is a columnar data warehouse DB that is ideal for running long complex queries. RedShift can also improve performance for repeat queries by caching the result and returning the cached result when queries are re-run. Dashboard, visualization, and business intelligence (BI) tools that execute repeat queries see a significant boost in performance due to result caching.

CORRECT: "RedShift for both use cases" is the correct answer.

INCORRECT: "RDS for both use cases" is incorrect. RDS may be a good fit for the fast queries (not for the complex queries) but you now have

multiple DBs to manage and multiple sets of data which is not going to be cost-effective.

INCORRECT: "RedShift for the analytics use case and ElastiCache in front of RedShift for the customer support dashboard" is incorrect. You could put ElastiCache in front of the RedShift DB and this would provide good performance for the fast, repeat queries. However, it is not essential and would add cost to the solution so is not the most cost-effective option available.

INCORRECT: "RedShift for the analytics use case and RDS for the customer support dashboard" is incorrect as RedShift is a better fit for both use cases.

51. Question

A DynamoDB database you manage is randomly experiencing heavy read requests that are causing latency. What is the simplest way to alleviate the performance issues?

1: Create DynamoDB read replicas

2: Enable EC2 Auto Scaling for DynamoDB

3: Create an ElastiCache cluster in front of DynamoDB

4: Enable DynamoDB DAX

Answer: 4

Explanation:

DynamoDB offers consistent single-digit millisecond latency. However, DynamoDB + DAX further increases performance with response times in microseconds for millions of requests per second for read-heavy workloads.

The DAX cache uses cluster nodes running on Amazon EC2 instances and sits in front of the DynamoDB table.

CORRECT: "Enable DynamoDB DAX" is the correct answer.

INCORRECT: "Create DynamoDB read replicas" is incorrect. There's no such thing as DynamoDB Read Replicas (Read Replicas are an RDS concept).

INCORRECT: "Enable EC2 Auto Scaling for DynamoDB" is incorrect. You cannot use EC2 Auto Scaling with DynamoDB. You can use Application Auto Scaling to scales DynamoDB but as the spikes in read

traffic are random and Auto Scaling needs time to adjust the capacity of the DB it wouldn't be as responsive as using DynamoDB DAX.

INCORRECT: "Create an ElastiCache cluster in front of DynamoDB" is incorrect. ElastiCache in front of DynamoDB is not the best answer as DynamoDB DAX is a simpler implementation and provides the required performance improvements.

52. Question

A customer has a production application running on Amazon EC2. The application frequently overwrites and deletes data, and it is essential that the application receives the most up-to-date version of the data whenever it is requested.

Which service is most appropriate for these requirements?

1: Amazon RedShift

2: Amazon S3

3: AWS Storage Gateway

4: Amazon RDS

Answer: 4

Explanation:

This scenario asks that when retrieving data the chosen storage solution should always return the most up-to-date data. Therefore we must use Amazon RDS as it provides read-after-write consistency.

CORRECT: "Amazon RDS" is the correct answer.

INCORRECT: "Amazon RedShift" is incorrect. Amazon RedShift is a data warehouse and is not used as a transactional database so this is the wrong use case for it.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 only provides eventual consistency for overwrites and deletes.

INCORRECT: "AWS Storage Gateway" is incorrect. AWS Storage Gateway is used for enabling hybrid cloud access to AWS storage services from on-premises.

53. Question

A Solutions Architect is developing a new web application on AWS that needs to be able to scale to support unpredictable workloads. The Architect prefers to focus on value-add activities such as software development and product roadmap development rather than provisioning and managing instances.
Which solution is most appropriate for this use case?
1: Amazon API Gateway and AWS Lambda
2: Elastic Load Balancing with Auto Scaling groups and Amazon EC2
3: Amazon CloudFront and AWS Lambda
4: Amazon API Gateway and Amazon EC2

Answer: 1
Explanation:
The Architect requires a solution that removes the need to manage instances. Therefore it must be a serverless service which rules out EC2. The two remaining options use AWS Lambda at the back-end for processing. Though CloudFront can trigger Lambda functions it is more suited to customizing content delivered from an origin. Therefore, API Gateway with AWS Lambda is the most workable solution presented.
This solution will likely require other services such as S3 for content and a database service. Refer to the link below for an example scenario that uses API Gateway and AWS Lambda with other services to create a serverless web application.
CORRECT: "Amazon API Gateway and AWS Lambda" is the correct answer.
INCORRECT: "Elastic Load Balancing with Auto Scaling groups and Amazon EC2" is incorrect as this option requires managing instances.
INCORRECT: "Amazon CloudFront and AWS Lambda" is incorrect as API Gateway is a better fit for the front end of this serverless web application.
INCORRECT: "Amazon API Gateway and Amazon EC2" is incorrect as this option requires managing instances.

54. Question
A client needs to implement a shared directory system. Requirements are that it should provide a hierarchical structure, support strong data

consistency, and be accessible from multiple accounts, regions and on-premises servers using their AWS Direct Connect link.

Which storage service would you recommend to the client?

1: AWS Storage Gateway

2: Amazon EBS

3: Amazon EFS

4: Amazon S3

Answer: 3

Explanation:

Amazon EFS provides high-performance, secure access for thousands of connections to a shared file system using a traditional file permissions model, file locking, and hierarchical directory structure via the NFSv4 protocol.

It allows you to simultaneously share files between multiple Amazon EC2 instances across multiple AZs, regions, VPCs, and accounts as well as on-premises servers via AWS Direct Connect or AWS VPN.

This is ideal for your business applications that need to share a common data source. For application workloads with many instances accessing the same set of files, Amazon EFS provides strong data consistency helping to ensure that any file read will reflect the last write of the file.

CORRECT: "Amazon EFS" is the correct answer.

INCORRECT: "AWS Storage Gateway" is incorrect. AWS Storage Gateway supports multiple modes of operation but none of them provide a single shared storage location that is accessible from multiple accounts, regions and on-premise servers simultaneously.

INCORRECT: "Amazon EBS" is incorrect. Amazon EBS is a block-storage device that is attached to an individual instance and cannot be shared between multiple instances. EBS does not support multiple requirements in this scenario.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 does not support a hierarchical structure. Though you can create folders within buckets, these are actually just pointers to groups of objects. The structure is flat in Amazon S3. Also, the consistency model of Amazon S3 is read-after-write for PUTS of new objects, but only eventual consistency for overwrite PUTS

and DELETES. This does not support the requirement for strong consistency.

55. Question

A customer runs an API on their website that receives around 1,000 requests each day and has an average response time of 50 ms. It is currently hosted on a single c4.large EC2 instance.

How can high availability be added to the architecture at the LOWEST cost?

1: Create an Auto Scaling group with a minimum of one instance and a maximum of two instances, then use an Application Load Balancer to balance the traffic

2: Recreate the API using API Gateway and use AWS Lambda as the service back-end

3: Create an Auto Scaling group with a maximum of two instances, then use an Application Load Balancer to balance the traffic

4: Recreate the API using API Gateway and integrate the API with the existing back-end

Answer: 2

Explanation:

The API does not receive a high volume of traffic or require extremely low latency. It would not be cost efficient to use multiple EC2 instances and Elastic Load Balancers. Instead the best course of action would be to recreate the API using API Gateway which will allow the customer to only pay for what they use. AWS Lambda can likewise be used for the back-end processing reducing cost by utilizing a pay for what you use serverless service.

CORRECT: "Recreate the API using API Gateway and use AWS Lambda as the service back-end" is the correct answer.

INCORRECT: "Create an Auto Scaling group with a minimum of one instance and a maximum of two instances, then use an Application Load Balancer to balance the traffic" is incorrect. Using Application Load Balancers with multiple EC2 instances would not be cost effective.

INCORRECT: "Create an Auto Scaling group with a maximum of two instances, then use an Application Load Balancer to balance the traffic" is

incorrect as this is not the lowest cost option.

INCORRECT: "Recreate the API using API Gateway and integrate the API with the existing back-end" is incorrect. If the architect recreates the API using API Gateway but integrates the API with the existing back-end this is not highly available and is not the lowest cost option.

56. Question

A large media site has multiple applications running on Amazon ECS. A Solutions Architect needs to use content metadata to route traffic to specific services.

What is the MOST efficient method to fulfil this requirement?

1: Use an AWS Classic Load Balancer with a host-based routing rule to route traffic to the correct service

2: Use the AWS CLI to update an Amazon Route 53 hosted zone to route traffic as services get updated

3: Use an AWS Application Load Balancer with a path-based routing rule to route traffic to the correct service

4: Use Amazon CloudFront to manage and route traffic to the correct service

Answer: 3

Explanation:

The ELB Application Load Balancer can route traffic based on data included in the request including the host name portion of the URL as well as the path in the URL. Creating a rule to route traffic based on information in the path will work for this solution and ALB works well with Amazon ECS.

CORRECT: "Use an AWS Application Load Balancer with a path-based routing rule to route traffic to the correct service" is the correct answer.

INCORRECT: "Use an AWS Classic Load Balancer with a host-based routing rule to route traffic to the correct service" is incorrect. The ELB Classic Load Balancer does not support any content-based routing including host or path-based.

INCORRECT: "Use the AWS CLI to update an Amazon Route 53 hosted zone to route traffic as services get updated" is incorrect. Using the AWS CLI to update Route 53 as to how to route traffic may work, but it is definitely not the most efficient way to solve this challenge.

INCORRECT: "Use Amazon CloudFront to manage and route traffic to the correct service" is incorrect. Amazon CloudFront does not have the capability to route traffic to different Amazon ECS services based on content metadata.

57. Question

You have created a file system using Amazon Elastic File System (EFS) which will hold home directories for users. What else needs to be done to enable users to save files to the EFS file system?

1: Create a separate EFS file system for each user and grant read-write-execute permissions on the root directory to the respective user. Then mount the file system to the users' home directory

2: Modify permissions on the root directory to grant read-write-execute permissions to the users. Then create a subdirectory and mount it to the users' home directory

3: Instruct the users to create a subdirectory on the file system and mount the subdirectory to their home directory

4: Create a subdirectory for each user and grant read-write-execute permissions to the users. Then mount the subdirectory to the users' home directory

Answer: 4

Explanation:

After creating a file system, by default, only the root user (UID 0) has read-write-execute permissions. For other users to modify the file system, the root user must explicitly grant them access.

One common use case is to create a "writable" subdirectory under this file system root for each user you create on the EC2 instance and mount it on the user's home directory. All files and subdirectories the user creates in their home directory are then created on the Amazon EFS file system

CORRECT: "Create a subdirectory for each user and grant read-write-execute permissions to the users. Then mount the subdirectory to the users' home directory" is the correct answer.

INCORRECT: "Create a separate EFS file system for each user and grant read-write-execute permissions on the root directory to the respective user. Then mount the file system to the users' home directory" is incorrect. You

don’t want to create a separate EFS file system for each user, this would be a higher cost and require more management overhead.

INCORRECT: "Modify permissions on the root directory to grant read-write-execute permissions to the users. Then create a subdirectory and mount it to the users’ home directory" is incorrect. You don’t want to modify permission on the root directory as this will mean all users are able to access other users’ files (and this is a home directory, so the contents are typically kept private).

INCORRECT: "Instruct the users to create a subdirectory on the file system and mount the subdirectory to their home directory" is incorrect. Instructing the users to create a subdirectory on the file system themselves would not work as they will not have access to write to the directory root.

58. Question

An application that you will be deploying in your VPC requires 14 EC2 instances that must be placed on distinct underlying hardware to reduce the impact of the failure of a hardware node. The instances will use varying instance types. What configuration will cater to these requirements taking cost-effectiveness into account?

1: You cannot control which nodes your instances are placed on

2: Use dedicated hosts and deploy each instance on a dedicated host

3: Use a Spread Placement Group across two AZs

4: Use a Cluster Placement Group within a single AZ

Answer: 3

Explanation:

A spread placement group is a group of instances that are each placed on distinct underlying hardware. Spread placement groups are recommended for applications that have a small number of critical instances that should be kept separate from each other. Launching instances in a spread placement group reduces the risk of simultaneous failures that might occur when instances share the same underlying hardware.

CORRECT: "Use a Spread Placement Group across two AZs" is the correct answer.

INCORRECT: "You cannot control which nodes your instances are placed on" is incorrect as you can use placement groups.

INCORRECT: "Use dedicated hosts and deploy each instance on a dedicated host" is incorrect. Using a single instance on each dedicated host would be extremely expensive.

INCORRECT: "Use a Cluster Placement Group within a single AZ" is incorrect. A cluster placement group is a logical grouping of instances within a single Availability Zone. Cluster placement groups are recommended for applications that benefit from low network latency, high network throughput, or both, and if the majority of the network traffic is between the instances in the group.

59. Question

A VPC has a fleet of EC2 instances running in a private subnet that need to connect to Internet-based hosts using the IPv6 protocol. What needs to be configured to enable this connectivity?

1: VPN CloudHub

2: A NAT Gateway

3: An Egress-Only Internet Gateway

4: AWS Direct Connect

Answer: 3

Explanation:

An egress-only Internet gateway is a horizontally scaled, redundant, and highly available VPC component that allows outbound communication over IPv6 from instances in your VPC to the Internet, and prevents the Internet from initiating an IPv6 connection with your instances.

CORRECT: "An Egress-Only Internet Gateway" is the correct answer.

INCORRECT: "VPN CloudHub" is incorrect. VPN CloudHub enables a hub-and-spoke model for communicating between multiple sites over a VPN connection.

INCORRECT: "A NAT Gateway" is incorrect. A NAT Gateway is used for enabling Internet connectivity using the IPv4 protocol only.

INCORRECT: "AWS Direct Connect" is incorrect. AWS Direct Connect is a private connection between your data center and an AWS VPC.

60. Question

An AWS workload in a VPC is running a legacy database on an Amazon EC2 instance. Data is stored on a 2000GB Amazon EBS (gp2) volume. At peak load times, logs show excessive wait time.

What should be implemented to improve database performance using persistent storage?

1: Change the EC2 instance type to one with burstable performance

2: Change the EC2 instance type to one with EC2 instance store volumes

3: Migrate the data on the Amazon EBS volume to an SSD-backed volume

4: Migrate the data on the EBS volume to provisioned IOPS SSD (io1)

Answer: 4

Explanation:

The data is already on an SSD-backed volume (gp2), therefore to improve performance the best option is to migrate the data onto a provisioned IOPS SSD (io1) volume type which will provide improved I/O performance and therefore reduce wait times.

CORRECT: "Migrate the data on the EBS volume to provisioned IOPS SSD (io1)" is the correct answer.

INCORRECT: "Change the EC2 instance type to one with burstable performance" is incorrect. Burstable performance instances provide a baseline of CPU performance with the ability to burst to a higher level when required. However, the issue in this scenario is disk wait time, not CPU performance, therefore we need to improve I/O not CPU performance.

INCORRECT: "Change the EC2 instance type to one with EC2 instance store volumes" is incorrect. Using an instance store volume may provide high performance but the data is not persistent so it is not suitable for a database.

INCORRECT: "Migrate the data on the Amazon EBS volume to an SSD-backed volume" is incorrect as the data is already on an SSD-backed volume (gp2).

61. Question

Developers regularly create and update CloudFormation stacks using API calls. For security reasons you need to ensure that users are restricted to a specified template. How can this be achieved?

1: Store the template on Amazon S3 and use a bucket policy to restrict access
2: Create an IAM policy with a Condition: ResourceTypes parameter
3: Create an IAM policy with a Condition: TemplateURL parameter
4: Create an IAM policy with a Condition: StackPolicyURL parameter

Answer: 3

Explanation:

The cloudformation:TemplateURL, lets you specify where the CloudFormation template for a stack action, such as create or update, resides and enforce that it be used.

CORRECT: "Create an IAM policy with a Condition: TemplateURL parameter" is the correct answer.

INCORRECT: "Store the template on Amazon S3 and use a bucket policy to restrict access" is incorrect. Configuring a bucket policy on the Amazon S3 bucket where you place your templates is a good idea, but it does not enforce CloudFormation create and update API requests to use the templates in the bucket.

INCORRECT: "Create an IAM policy with a Condition: ResourceTypes parameter" is incorrect. The CloudFormation API accepts a ResourceTypes parameter. In your API call, you specify which types of resources can be created or updated. This does not control which template is used.

INCORRECT: "Create an IAM policy with a Condition: StackPolicyURL parameter" is incorrect. You can ensure that every CloudFormation stack has a stack policy associated with it upon creation with the StackPolicyURL condition. However, this parameter itself is not used to specify the template to use.

62. Question

A data-processing application runs on an i3.large EC2 instance with a single 100 GB EBS gp2 volume. The application stores temporary data in a small database (less than 30 GB) located on the EBS root volume. The application is struggling to process the data fast enough, and a Solutions Architect has determined that the I/O speed of the temporary database is the bottleneck.

What is the MOST cost-efficient way to improve the database response times?

1: Put the temporary database on a new 50-GB EBS io1 volume with a 3000 IOPS allocation

2: Move the temporary database onto instance storage

3: Put the temporary database on a new 50-GB EBS gp2 volume

4: Enable EBS optimization on the instance and keep the temporary files on the existing volume

Answer: 2

Explanation:

EC2 Instance Stores are high-speed ephemeral storage that is physically attached to the EC2 instance. The i3.large instance type comes with a single 475GB NVMe SSD instance store so it would be a good way to lower cost and improve performance by using the attached instance store. As the files are temporary, it can be assumed that ephemeral storage (which means the data is lost when the instance is stopped) is sufficient.

CORRECT: "Move the temporary database onto instance storage" is the correct answer.

INCORRECT: "Put the temporary database on a new 50-GB EBS io1 volume with a 3000 IOPS allocation" is incorrect. Moving the DB to a new 50-GB EBS io1 volume with a 3000 IOPS allocation will improve performance but is more expensive so will not be the most cost-efficient solution.

INCORRECT: "Put the temporary database on a new 50-GB EBS gp2 volume" is incorrect. Moving the DB to a new 50-GB EBS gp2 volume will not result in a performance improvement as you get IOPS allocated per GB so a smaller volume will have lower performance.

INCORRECT: "Enable EBS optimization on the instance and keep the temporary files on the existing volume" is incorrect. Enabling EBS optimization will not lower cost. Also, EBS Optimization is a network traffic optimization, it does not change the I/O performance of the volume.

63. Question

A Solutions Architect is designing a shared service for hosting containers from several customers on Amazon ECS. These containers

will use several AWS services. A container from one customer must not be able to access data from another customer.

Which solution should the Architect use to meet the requirements?

1: IAM roles for tasks

2: IAM roles for EC2 instances

3: IAM Instance Profile for EC2 instances

4: Network ACL

Answer: 1

Explanation:

IAM roles for ECS tasks enabled you to secure your infrastructure by assigning an IAM role directly to the ECS task rather than to the EC2 container instance. This means you can have one task that uses a specific IAM role for access to S3 and one task that uses an IAM role to access DynamoDB.

IAM roles can be specified at the container and task level on EC2 launch type and the task level on Fargate launch type.

CORRECT: "IAM roles for tasks" is the correct answer.

INCORRECT: "IAM roles for EC2 instances" is incorrect. With IAM roles for EC2 instances you assign all of the IAM policies required by tasks in the cluster to the EC2 instances that host the cluster. This does not allow the secure separation requested.

INCORRECT: "IAM Instance Profile for EC2 instances" is incorrect. An instance profile is a container for an IAM role that you can use to pass role information to an EC2 instance when the instance starts. Again, this does not allow the secure separation requested.

INCORRECT: "Network ACL" is incorrect. Network ACLs are applied at the subnet level and would not assist here.

64. Question

An EC2 instance that you manage has an IAM role attached to it that provides it with access to Amazon S3 for saving log data to a bucket. A change in the application architecture means that you now need to provide the additional ability for the application to securely make API requests to Amazon API Gateway.

Which two methods could you use to resolve this challenge? (Select TWO)

1: Delegate access to the EC2 instance from the API Gateway management console

2: Create an IAM role with a policy granting permissions to Amazon API Gateway and add it to the EC2 instance as an additional IAM role

3: You cannot modify the IAM role assigned to an EC2 instance after it has been launched. You'll need to recreate the EC2 instance and assign a new IAM role

4: Add an IAM policy to the existing IAM role that the EC2 instance is using granting permissions to access Amazon API Gateway

5: Create a new IAM role with multiple IAM policies attached that grants access to Amazon S3 and Amazon API Gateway, and replace the existing IAM role that is attached to the EC2 instance

Answer: 4,5

Explanation:

There are two possible solutions here. In one you create a new IAM role with multiple policies, in the other you add a new policy to the existing IAM role.

Contrary to one of the incorrect answers, you **can** modify IAM roles after an instance has been launched – this was changed quite some time ago now. However, you **cannot** add multiple IAM roles to a single EC2 instance. If you need to attach multiple policies you must attach them to a single IAM role. There is no such thing as delegating access using the API Gateway management console.

CORRECT: "Add an IAM policy to the existing IAM role that the EC2 instance is using granting permissions to access Amazon API Gateway" is the correct answer.

CORRECT: "Create a new IAM role with multiple IAM policies attached that grants access to Amazon S3 and Amazon API Gateway, and replace the existing IAM role that is attached to the EC2 instance" is the correct answer.

INCORRECT: "Delegate access to the EC2 instance from the API Gateway management console" is incorrect as you cannot delegate in this manner.

INCORRECT: "Create an IAM role with a policy granting permissions to Amazon API Gateway and add it to the EC2 instance as an additional IAM

role" is incorrect as you cannot attach an additional IAM role, you can only have one attached to an instance at a time.

INCORRECT: "You cannot modify the IAM role assigned to an EC2 instance after it has been launched. You'll need to recreate the EC2 instance and assign a new IAM role" is incorrect as this statement is incorrect, you can.

65. Question

An application is hosted on the U.S west coast. Users there have no problems, but users on the east coast are experiencing performance issues. The users have reported slow response times with the search bar autocomplete and display of account listings.

How can you improve the performance for users on the east coast?

1: Host the static content in an Amazon S3 bucket and distribute it using CloudFront

2: Setup cross-region replication and use Route 53 geolocation routing

3: Create a DynamoDB Read Replica in the U.S east region

4: Create an ElastiCache database in the U.S east region

Answer: 4

Explanation:

ElastiCache can be deployed in the U.S east region to provide high-speed access to the content. ElastiCache Redis has a good use case for autocompletion (see links below).

CORRECT: "Create an ElastiCache database in the U.S east region" is the correct answer.

INCORRECT: "Host the static content in an Amazon S3 bucket and distribute it using CloudFront" is incorrect. This is not static content that can be hosted in an Amazon S3 bucket and distributed using CloudFront.

INCORRECT: "Setup cross-region replication and use Route 53 geolocation routing" is incorrect. Cross-region replication is an Amazon S3 concept and the dynamic data that is presented by this application is unlikely to be stored in an S3 bucket.

INCORRECT: "Create a DynamoDB Read Replica in the U.S east region" is incorrect. There's no such thing as a DynamoDB Read Replica (Read Replicas are an RDS concept).

SET 3: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 3: Practice Questions, Answers & Explanations

1. Question

A security officer requires that access to company financial reports is logged. The reports are stored in an Amazon S3 bucket. Additionally, any modifications to the log files must be detected.

Which actions should a solutions architect take?

1: Use S3 server access logging on the bucket that houses the reports with the read and write data events and the log file validation options enabled

2: Use S3 server access logging on the bucket that houses the reports with the read and write management events and log file validation options enabled

3: Use AWS CloudTrail to create a new trail. Configure the trail to log read and write data events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation

4: Use AWS CloudTrail to create a new trail. Configure the trail to log read and write management events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation

2. Question

A company operates a production web application that uses an Amazon RDS MySQL database. The database has automated, non-encrypted daily backups. To increase the security of the data, it has been recommended that encryption should be enabled for backups. Unencrypted backups will be destroyed after the first encrypted backup has been completed.

What should be done to enable encryption for future backups?

1: Enable default encryption for the Amazon S3 bucket where backups are stored

2: Modify the backup section of the database configuration to toggle the Enable encryption check box

3: Create a snapshot of the database. Copy it to an encrypted snapshot. Restore the database from the encrypted snapshot

4: Enable an encrypted read replica on RDS for MySQL. Promote the encrypted read replica to primary. Remove the original database instance

3. Question

A company has deployed an API in a VPC behind an internal Application Load Balancer (ALB). An application that consumes the API as a client is deployed in a second account in private subnets.

Which architectural configurations will allow the API to be consumed without using the public Internet? (Select TWO)

1: Configure a VPC peering connection between the two VPCs. Access the API using the private address

2: Configure an AWS Direct Connect connection between the two VPCs. Access the API using the private address

3: Configure a ClassicLink connection for the API into the client VPC. Access the API using the ClassicLink address

4: Configure a PrivateLink connection for the API into the client VPC. Access the API using the PrivateLink address

5: Configure an AWS Resource Access Manager connection between the two accounts. Access the API using the private address

4. Question

An application runs on Amazon EC2 Linux instances. The application generates log files which are written using standard API calls. A storage solution is required that can be used to store the files indefinitely and must allow concurrent access to all files.

Which storage service meets these requirements and is the MOST cost-effective?

1: Amazon EBS

2: Amazon EFS

3: Amazon EC2 instance store

4: Amazon S3

5. Question

A production application runs on an Amazon RDS MySQL DB instance. A solutions architect is building a new reporting tool that will access the same data. The reporting tool must be highly available and not impact the performance of the production application.

How can this be achieved?

1: Create a cross-region Multi-AZ deployment and create a read replica in the second region

2: Create a Multi-AZ RDS Read Replica of the production RDS DB instance

3: Use Amazon Data Lifecycle Manager to automatically create and manage snapshots

4: Create a Single-AZ RDS Read Replica of the production RDS DB instance. Create a second Single-AZ RDS Read Replica from the replica

6. Question

An online store uses an Amazon Aurora database. The database is deployed as a Multi-AZ deployment. Recently, metrics have shown that database read requests are high and causing performance issues which result in latency for write requests.

What should the solutions architect do to separate the read requests from the write requests?

1: Enable read through caching on the Amazon Aurora database

2: Update the application to read from the Multi-AZ standby instance

3: Create a read replica and modify the application to use the appropriate endpoint

4: Create a second Amazon Aurora database and link it to the primary database as a read replica

7. Question

An application is deployed on multiple AWS regions and accessed from around the world. The application exposes static public IP addresses. Some users are experiencing poor performance when accessing the application over the Internet.

What should a solutions architect recommend to reduce internet latency?

1: Set up AWS Global Accelerator and add endpoints

2: Set up AWS Direct Connect locations in multiple Regions

3: Set up an Amazon CloudFront distribution to access an application

4: Set up an Amazon Route 53 geoproximity routing policy to route traffic

8. Question

A new application will be launched on an Amazon EC2 instance with an Elastic Block Store (EBS) volume. A solutions architect needs to determine the most cost-effective storage option. The application will have infrequent usage, with peaks of traffic for a couple of hours in the morning and evening. Disk I/O is variable with peaks of up to 3,000 IOPS.

Which solution should the solutions architect recommend?

1: Amazon EBS Cold HDD (sc1)

2: Amazon EBS General Purpose SSD (gp2)

3: Amazon EBS Provisioned IOPS SSD (io1)

4: Amazon EBS Throughput Optimized HDD (st1)

9. Question

A security team wants to limit access to specific services or actions in all of the team's AWS accounts. All accounts belong to a large organization in AWS Organizations. The solution must be scalable and there must be a single point where permissions can be maintained.

What should a solutions architect do to accomplish this?

1: Create an ACL to provide access to the services or actions

2: Create a security group to allow accounts and attach it to user groups

3: Create cross-account roles in each account to deny access to the services or actions

4: Create a service control policy in the root organizational unit to deny access to the services or actions

10. Question

A company is planning to use Amazon S3 to store documents uploaded by its customers. The images must be encrypted at rest in Amazon S3. The company does not want to spend time managing and rotating the keys, but it does want to control who can access those keys.

What should a solutions architect use to accomplish this?

1: Server-Side Encryption with keys stored in an S3 bucket

2: Server-Side Encryption with Customer-Provided Keys (SSE-C)

3: Server-Side Encryption with Amazon S3-Managed Keys (SSE-S3)

4: Server-Side Encryption with AWS KMS-Managed Keys (SSE-KMS)

11. Question

A company has some statistical data stored in an Amazon RDS database. The company want to allow users to access this information using an API. A solutions architect must create a solution that allows sporadic access to the data, ranging from no requests to large bursts of traffic.

Which solution should the solutions architect suggest?

1: Set up an Amazon API Gateway and use Amazon ECS

2: Set up an Amazon API Gateway and use AWS Elastic Beanstalk

3: Set up an Amazon API Gateway and use AWS Lambda functions

4: Set up an Amazon API Gateway and use Amazon EC2 with Auto Scaling

12. Question

A company runs a financial application using an Amazon EC2 Auto Scaling group behind an Application Load Balancer (ALB). When running month-end reports on a specific day and time each month the application becomes unacceptably slow. Amazon CloudWatch metrics show the CPU utilization hitting 100%.

What should a solutions architect recommend to ensure the application is able to handle the workload and avoid downtime?

1: Configure an Amazon CloudFront distribution in front of the ALB

2: Configure an EC2 Auto Scaling simple scaling policy based on CPU utilization

3: Configure an EC2 Auto Scaling scheduled scaling policy based on the monthly schedule

4: Configure Amazon ElastiCache to remove some of the workload from the EC2 instances

13. Question

A solutions architect is designing a high performance computing (HPC) application using Amazon EC2 Linux instances. All EC2 instances need to communicate to each other with low latency and high throughput network performance.

Which EC2 solution BEST meets these requirements?

1: Launch the EC2 instances in a cluster placement group in one Availability Zone

2: Launch the EC2 instances in a spread placement group in one Availability Zone

3: Launch the EC2 instances in an Auto Scaling group in two Regions. Place a Network Load Balancer in front of the instances

4: Launch the EC2 instances in an Auto Scaling group spanning multiple Availability Zones

14. Question

A web application in a three-tier architecture runs on a fleet of Amazon EC2 instances. Performance issues have been reported and investigations point to insufficient swap space. The operations team requires monitoring to determine if this is correct.

What should a solutions architect recommend?

1: Configure an Amazon CloudWatch SwapUsage metric dimension. Monitor the SwapUsage dimension in the EC2 metrics in CloudWatch

2: Use EC2 metadata to collect information, then publish it to Amazon CloudWatch custom metrics. Monitor SwapUsage metrics in CloudWatch

3: Install an Amazon CloudWatch agent on the instances. Run an appropriate script on a set schedule. Monitor SwapUtilization metrics in CloudWatch

4: Enable detailed monitoring in the EC2 console. Create an Amazon CloudWatch SwapUtilization custom metric. Monitor SwapUtilization metrics in CloudWatch

15. Question

A gaming company collects real-time data and stores it in an on-premises database system. The company are migrating to AWS and need better performance for the database. A solutions architect has been asked to recommend an in-memory database that supports data replication.

Which database should a solutions architect recommend?

1: Amazon RDS for MySQL

2: Amazon RDS for PostgreSQL

3: Amazon ElastiCache for Redis

4: Amazon ElastiCache for Memcached

16. Question

A company has experienced malicious traffic from some suspicious IP addresses. The security team discovered the requests are from different IP addresses under the same CIDR range.

What should a solutions architect recommend to the team?

1: Add a rule in the inbound table of the security group to deny the traffic from that CIDR range

2: Add a rule in the outbound table of the security group to deny the traffic from that CIDR range

3: Add a deny rule in the inbound table of the network ACL with a lower rule number than other rules

4: Add a deny rule in the outbound table of the network ACL with a lower rule number than other rules

17. Question

A solutions architect is designing a microservices architecture. AWS Lambda will store data in an Amazon DynamoDB table named Orders. The solutions architect needs to apply an IAM policy to the Lambda function's execution role to allow it to put, update, and delete items in the Orders table. No other actions should be allowed.

Which of the following code snippets should be included in the IAM policy to fulfill this requirement whilst providing the LEAST privileged access?

1:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
  ],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

2:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
  ],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/*"

3:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

4:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Deny",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

18. Question

A company has created a duplicate of its environment in another AWS Region. The application is running in warm standby mode. There is an Application Load Balancer (ALB) in front of the application. Currently, failover is manual and requires updating a DNS alias record to point to the secondary ALB.

How can a solutions architect automate the failover process?

1: Enable an ALB health check

2: Enable an Amazon Route 53 health check

3: Create a CNAME record on Amazon Route 53 pointing to the ALB endpoint

4: Create a latency based routing policy on Amazon Route 53

19. Question

An application allows users to upload and download files. Files older than 2 years will be accessed less frequently. A solutions architect needs to ensure that the application can scale to any number of files while maintaining high availability and durability.

Which scalable solutions should the solutions architect recommend?

1: Store the files on Amazon S3 with a lifecycle policy that moves objects older than 2 years to S3 Standard Infrequent Access (S3 Standard-IA)

2: Store the files on Amazon Elastic File System (EFS) with a lifecycle policy that moves objects older than 2 years to EFS Infrequent Access (EFS IA)

3: Store the files in Amazon Elastic Block Store (EBS) volumes. Schedule snapshots of the volumes. Use the snapshots to archive data older than 2 years

4: Store the files in Amazon Elastic Block Store (EBS) volumes. Create a lifecycle policy to move files older than 2 years to Amazon S3 Glacier

20. Question

A company is planning to migrate a large quantity of important data to Amazon S3. The data will be uploaded to a versioning enabled bucket in the us-west-1 Region. The solution needs to include replication of the data to another Region for disaster recovery purposes.

How should a solutions architect configure the replication?

1: Create an additional S3 bucket in another Region and configure cross-Region replication

2: Create an additional S3 bucket in another Region and configure cross-origin resource sharing (CORS)

3: Create an additional S3 bucket with versioning in another Region and configure cross-Region replication

4: Create an additional S3 bucket with versioning in another Region and configure cross-origin resource sharing (CORS)

21. Question

An application runs on Amazon EC2 instances across multiple Availability Zones. The instances run in an Amazon EC2 Auto Scaling group behind an Application Load Balancer. The application performs best when the CPU utilization of the EC2 instances is at or near 40%.

What should a solutions architect do to maintain the desired performance across all instances in the group?

1: Use a simple scaling policy to dynamically scale the Auto Scaling group

2: Use a target tracking policy to dynamically scale the Auto Scaling group

3: Use an AWS Lambda function to update the desired Auto Scaling group capacity

4: Use scheduled scaling actions to scale up and scale down the Auto Scaling group

22. Question

A High Performance Computing (HPC) application needs storage that can provide 135,000 IOPS. The storage layer is replicated across all instances in a cluster.

What is the optimal storage solution that provides the required performance and is cost-effective?

1: Use Amazon EBS Provisioned IOPS volume with 135,000 IOPS

2: Use Amazon Instance Store

3: Use Amazon S3 with byte-range fetch

4: Use Amazon EC2 Enhanced Networking with an EBS HDD Throughput Optimized volume

23. Question

A high-performance file system is required for a financial modelling application. The data set will be stored on Amazon S3 and the storage solution must have seamless integration so objects can be accessed as files.

Which storage solution should be used?

1: Amazon FSx for Windows File Server

2: Amazon FSx for Lustre

3: Amazon Elastic File System (EFS)

4: Amazon Elastic Block Store (EBS)

24. Question

An application requires a MySQL database which will only be used several times a week for short periods. The database needs to provide automatic instantiation and scaling. Which database service is most suitable?

1: Amazon RDS MySQL

2: Amazon EC2 instance with MySQL database installed

3: Amazon Aurora

4: Amazon Aurora Serverless

25. Question

An Architect needs to find a way to automatically and repeatably create many member accounts within an AWS Organization. The accounts also need to be moved into an OU and have VPCs and subnets created.

What is the best way to achieve this?

1: Use the AWS Organizations API

2: Use CloudFormation with scripts

3: Use the AWS Management Console

4: Use the AWS CLI

26. Question

An organization is extending a secure development environment into AWS. They have already secured the VPC including removing the

Internet Gateway and setting up a Direct Connect connection. What else needs to be done to add encryption?

1: Setup a Virtual Private Gateway (VPG)

2: Enable IPSec encryption on the Direct Connect connection

3: Setup the Border Gateway Protocol (BGP) with encryption

4: Configure an AWS Direct Connect Gateway

27. Question

A shared services VPC is being setup for use by several AWS accounts. An application needs to be securely shared from the shared services VPC. The solution should not allow consumers to connect to other instances in the VPC.

How can this be setup with the least administrative effort? (Select TWO)

1: Create a Network Load Balancer (NLB)

2: Use AWS PrivateLink to expose the application as an endpoint service

3: Use AWS ClassicLink to expose the application as an endpoint service

4: Setup VPC peering between each AWS VPC

5: Configure security groups to restrict access

28. Question

A web app allows users to upload images for viewing online. The compute layer that processes the images is behind an Auto Scaling group. The processing layer should be decoupled from the front end and the ASG needs to dynamically adjust based on the number of images being uploaded.

How can this be achieved?

1: Create an Amazon SNS Topic to generate a notification each time a message is uploaded. Have the ASG scale based on the number of SNS messages

2: Create a target tracking policy that keeps the ASG at 70% CPU utilization

3: Create an Amazon SQS queue and custom CloudWatch metric to measure the number of messages in the queue. Configure the ASG to scale based on the number of messages in the queue

4: Create a scheduled policy that scales the ASG at times of expected peak load

29. Question

A web application is running on a fleet of Amazon EC2 instances using an Auto Scaling Group. It is desired that the CPU usage in the fleet is kept at 40%.

How should scaling be configured?

1: Use a simple scaling policy that launches instances when the average CPU hits 40%

2: Use a target tracking policy that keeps the average aggregate CPU utilization at 40%

3: Use a step scaling policy that uses the PercentChangeInCapacity value to adjust the group size as required

4: Use a custom CloudWatch alarm to monitor CPU usage and notify the ASG using Amazon SNS

30. Question

Health related data in Amazon S3 needs to be frequently accessed for up to 90 days. After that time the data must be retained for compliance reasons for seven years and is rarely accessed.

Which storage classes should be used?

1: Store data in STANDARD for 90 days then transition the data to DEEP_ARCHIVE

2: Store data in INTELLIGENT_TIERING for 90 days then transition to STANDARD_IA

3: Store data in STANDARD for 90 days then expire the data

4: Store data in STANDARD for 90 days then transition to REDUCED_REDUNDANCY

31. Question

An e-commerce web application needs a highly scalable key-value database. Which AWS database service should be used?

1: Amazon RDS

2: Amazon RedShift

3: Amazon DynamoDB
4: Amazon ElastiCache

32. Question

You work for Digital Cloud Training and have just created a number of IAM users in your AWS account. You need to ensure that the users are able to make API calls to AWS services. What else needs to be done?

1: Enable Multi-Factor Authentication for the users
2: Create a set of Access Keys for the users
3: Set a password for each user
4: Create a group and add the users to it

33. Question

A Solutions Architect is migrating a small relational database into AWS. The database will run on an EC2 instance and the DB size is around 500 GB. The database is infrequently used with small amounts of requests spread across the day. The DB is a low priority and the Architect needs to lower the cost of the solution.

What is the MOST cost-effective storage type?

1: Amazon EBS Provisioned IOPS SSD
2: Amazon EFS
3: Amazon EBS Throughput Optimized HDD
4: Amazon EBS General Purpose SSD

34. Question

A Solutions Architect is designing a solution for a financial application that will receive trading data in large volumes. What is the best solution for ingesting and processing a very large number of data streams in near real time?

1: Amazon Redshift
2: Amazon Kinesis Firehose
3: Amazon EMR
4: Amazon Kinesis Data Streams

35. Question

You have created an application in a VPC that uses a Network Load Balancer (NLB). The application will be offered in a service provider model for AWS principals in other accounts within the region to consume. Based on this model, what AWS service will be used to offer the service for consumption?

1: IAM Role Based Access Control

2: Route 53

3: VPC Endpoint Services using AWS PrivateLink

4: API Gateway

36. Question

A company is migrating an on-premises 10 TB MySQL database to AWS. The company expects the database to quadruple in size and the business requirement is that replicate lag must be kept under 100 milliseconds.

Which Amazon RDS engine meets these requirements?

1: Amazon Aurora

2: Oracle

3: Microsoft SQL Server

4: MySQL

37. Question

A Solutions Architect is determining the best method for provisioning Internet connectivity for a data-processing application that will pull large amounts of data from an object storage system via the Internet. The solution must be redundant and have no constraints on bandwidth.

Which option satisfies these requirements?

1: Deploy NAT Instances in a public subnet

2: Use a NAT Gateway

3: Create a VPC endpoint

4: Attach an Internet Gateway

38. Question

You need a service that can provide you with control over which traffic to allow or block to your web applications by defining customizable web

security rules. You need to block common attack patterns, such as SQL injection and cross-site scripting, as well as creating custom rules for your own applications.

Which AWS service fits these requirements?

1: Security Groups

2: AWS WAF

3: CloudFront

4: Route 53

39. Question

A Solutions Architect is designing a mobile application that will capture receipt images to track expenses. The Architect wants to store the images on Amazon S3. However, uploading the images through the web server will create too much traffic.

What is the MOST efficient method to store images from a mobile application on Amazon S3?

1: Expand the web server fleet with Spot instances to provide the resources to handle the images

2: Upload to a second bucket, and have a Lambda event copy the image to the primary bucket

3: Upload to a separate Auto Scaling Group of server behind an ELB Classic Load Balancer, and have the server instances write to the Amazon S3 bucket

4: Upload directly to S3 using a pre-signed URL

40. Question

An EC2 status check on an EBS volume is showing as *insufficient-data* . What is the most likely explanation?

1: The checks have failed on the volume

2: The checks may still be in progress on the volume

3: The volume does not have enough data on it to check properly

4: The checks require more information to be manually entered

41. Question

A Kinesis consumer application is reading at a slower rate than expected. It has been identified that multiple consumer applications

have total reads exceeding the per-shard limits. How can this situation be resolved?

1: Increase the number of shards in the Kinesis data stream

2: Implement API throttling to restrict the number of requests per-shard

3: Increase the number of read transactions per shard

4: Implement read throttling for the Kinesis data stream

42. Question

A Solutions Architect is designing a workload that requires a high performance object-based storage system that must be shared with multiple Amazon EC2 instances.

Which AWS service delivers these requirements?

1: Amazon S3

2: Amazon ElastiCache

3: Amazon EFS

4: Amazon EBS

43. Question

You have been asked to deploy a new High-Performance Computing (HPC) cluster. You need to create a design for the EC2 instances that ensures close proximity, low latency and high network throughput.

Which AWS features will help you to achieve this requirement whilst considering cost? (Select TWO)

1: Use Provisioned IOPS EBS volumes

2: Launch I/O Optimized EC2 instances in one private subnet in an AZ

3: Use EC2 instances with Enhanced Networking

4: Use dedicated hosts

5: Use Placement groups

44. Question

An issue has been reported whereby Amazon EC2 instances are not being terminated from an Auto Scaling Group behind an ELB when traffic volumes are low. How can this be fixed?

1: Modify the upper threshold settings on the ASG

2: Modify the lower threshold settings on the ASG
3: Modify the scale down increment
4: Modify the scaling settings on the ELB

45. Question

Your Business Intelligence team use SQL tools to analyze data. What would be the best solution for performing queries on structured data that is being received at a high velocity?

1: EMR using Hive
2: Kinesis Firehose with RDS
3: EMR running Apache Spark
4: Kinesis Firehose with RedShift

46. Question

A new security mandate requires that all personnel data held in the cloud is encrypted at rest. Which two methods allow you to encrypt data stored in S3 buckets at rest cost-efficiently? (Select TWO)

1: Make use of AWS S3 bucket policies to control access to the data at rest
2: Use AWS S3 server-side encryption with Key Management Service keys or Customer-provided keys
3: Use CloudHSM
4: Encrypt the data at the source using the client's CMK keys before transferring it to S3
5: Use Multipart upload with SSL

47. Question

An application stack includes an Elastic Load Balancer in a public subnet, a fleet of Amazon EC2 instances in an Auto Scaling Group, and an Amazon RDS MySQL cluster. Users connect to the application from the Internet. The application servers and database must be secure. What is the most appropriate architecture for the application stack?

1: Create a public subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster
2: Create a public subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster

3: Create a private subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster

4: Create a private subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster

48. Question

An application currently stores all data on Amazon EBS volumes. All EBS volumes must be backed up durably across multiple Availability Zones.

What is the MOST resilient way to back up volumes?

1: Take regular EBS snapshots

2: Enable EBS volume encryption

3: Mirror data across two EBS volumes

4: Create a script to copy data to an EC2 instance store

49. Question

You have implemented API Gateway and enabled a cache for a specific stage. How can you control the cache to enhance performance and reduce load on back-end services?

1: Configure the throttling feature

2: Enable bursting

3: Using time-to-live (TTL) settings

4: Using CloudFront controls

50. Question

The development team at your company have created a new mobile application that will be used by users to access confidential data. The developers have used Amazon Cognito for authentication, authorization, and user management. Due to the sensitivity of the data, there is a requirement to add another method of authentication in addition to a username and password.

You have been asked to recommend the best solution. What is your recommendation?

1: Use multi-factor authentication (MFA) with a Cognito user pool

2: Integrate a third-party identity provider (IdP)

3: Enable multi-factor authentication (MFA) in IAM

4: Integrate IAM with a user pool in Cognito

51. Question

A company is serving videos to their customers from us-east-1 from an Amazon S3 bucket. The company's customers are located around the world and there is high demand during peak hours. Customers in Asia complain about slow download speeds during peak hours and customers in all locations have reported experiencing HTTP 500 errors.

How can a Solutions Architect address the issues?

1: Use an Amazon Route 53 weighted routing policy for the CloudFront domain name to distribute GET requests between CloudFront and the S3 bucket

2: Replicate the bucket in us-east-1 and use Amazon Route 53 failover routing to determine which bucket to serve the content from

3: Cache the web content using Amazon CloudFront and use all Edge locations for content delivery

4: Place an Amazon ElastiCache cluster in front of the S3 bucket

52. Question

There is expected to be a large increase in write intensive traffic to a website you manage that registers users onto an online learning program. You are concerned about writes to the database being dropped and need to come up with a solution to ensure this does not happen.

Which of the solution options below would be the best approach to take?

1: Update the application to write data to an SQS queue and provision additional EC2 instances to process the data and write it to the database

2: Use RDS in a multi-AZ configuration to distribute writes across AZs

3: Use CloudFront to cache the writes and configure the database as a custom origin

4: Update the application to write data to an S3 bucket and provision additional EC2 instances to process the data and write it to the database

53. Question

You are designing a solution on AWS that requires a file storage layer that can be shared between multiple EC2 instances. The storage should be highly-available and should scale easily.

Which AWS service can be used for this design?

1: Amazon S3

2: Amazon EC2 instance store

3: Amazon EFS

4: Amazon EBS

54. Question

A company is generating large datasets with millions of rows that must be summarized by column. Existing business intelligence tools will be used to build daily reports.

Which storage service meets the requirements?

1: Amazon DynamoDB

2: Amazon RDS

3: Amazon RedShift

4: Amazon ElastiCache

55. Question

You need to scale read operations for your Amazon Aurora DB within a region. To increase availability you also need to be able to failover if the primary instance fails.

What should you implement?

1: Aurora Replicas

2: A DB cluster

3: An Aurora Cluster Volume

4: Aurora Global Database

56. Question

An Architect is designing a serverless application that will accept images uploaded by users from around the world. The application will make API calls to back-end services and save the session state data of the user to a database.

Which combination of services would provide a solution that is cost-effective while delivering the least latency?

1: Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, DynamoDB

2: Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, Amazon RDS

3: Amazon S3, API Gateway, AWS Lambda, Amazon RDS

4: API Gateway, Amazon S3, AWS Lambda, DynamoDB

57. Question

You are developing an application that uses Lambda functions. You need to store some sensitive data that includes credentials for accessing the database tier. You are planning to store this data as environment variables within Lambda. How can you ensure this sensitive information is properly secured?

1: This cannot be done, only the environment variables that relate to the Lambda function itself can be encrypted

2: Use encryption helpers that leverage AWS Key Management Service to store the sensitive information as Ciphertext

3: There is no need to make any changes as all environment variables are encrypted by default with AWS Lambda

4: Store the environment variables in an encrypted DynamoDB table and configure Lambda to retrieve them as required

58. Question

You are deploying an application on Amazon EC2 that must call AWS APIs. Which method of securely passing credentials to the application should you use?

1: Store the API credentials on the instance using instance metadata

2: Store API credentials as an object in Amazon S3

3: Embed the API credentials into your application files

4: Assign IAM roles to the EC2 instances

59. Question

A Solutions Architect needs to monitor application logs and receive a notification whenever a specific number of occurrences of certain HTTP status code errors occur. Which tool should the Architect use?

1: CloudWatch Metrics

2: CloudWatch Events

3: CloudTrail Trails

4: CloudWatch Logs

60. Question

A Solutions Architect is designing a static website that will use the zone apex of a DNS domain (e.g. example.com). The Architect wants to use the Amazon Route 53 service. Which steps should the Architect take to implement a scalable and cost-effective solution? (Select TWO)

1: Create a Route 53 hosted zone, and set the NS records of the domain to use Route 53 name servers

2: Serve the website from an Amazon S3 bucket, and map a Route 53 Alias record to the website endpoint

3: Host the website on an Amazon EC2 instance, and map a Route 53 Alias record to the public IP address of the EC2 instance

4: Host the website using AWS Elastic Beanstalk, and map a Route 53 Alias record to the Beanstalk stack

5: Host the website on an Amazon EC2 instance with ELB and Auto Scaling, and map a Route 53 Alias record to the ELB endpoint

61. Question

A Solutions Architect is designing a web page for event registrations and needs a managed service to send a text message to users every time users sign up for an event.

Which AWS service should the Architect use to achieve this?

1: Amazon STS

2: Amazon SQS

3: AWS Lambda

4: Amazon SNS

62. Question

A company runs a service on AWS to provide offsite backups for images on laptops and phones. The solution must support millions of customers, with thousands of images per customer. Images will be retrieved infrequently but must be available for retrieval immediately.
Which is the MOST cost-effective storage option that meets these requirements?
1: Amazon Glacier with expedited retrievals
2: Amazon S3 Standard-Infrequent Access
3: Amazon EFS
4: Amazon S3 Standard

63. Question
A Solutions Architect is designing a solution to store and archive corporate documents, and has determined that Amazon Glacier is the right solution. Data must be delivered within 10 minutes of a retrieval request.
Which features in Amazon Glacier can help meet this requirement?
1: Standard retrieval
2: Bulk retrieval
3: Expedited retrieval
4: Vault Lock

64. Question
You are planning to deploy a number of EC2 instances in your VPC. The EC2 instances will be deployed across several subnets and multiple AZs. What AWS feature can act as an instance-level firewall to control traffic between your EC2 instances?
1: AWS WAF
2: Security group
3: Route table
4: Network ACL

65. Question
A critical database runs in your VPC for which availability is a concern. Which RDS DB instance events may force the DB to be taken offline

during a maintenance window?

1: Selecting the Multi-AZ feature
2: Security patching
3: Promoting a Read Replica
4: Updating DB parameter groups

SET 3: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

A security officer requires that access to company financial reports is logged. The reports are stored in an Amazon S3 bucket. Additionally, any modifications to the log files must be detected.

Which actions should a solutions architect take?

1: Use S3 server access logging on the bucket that houses the reports with the read and write data events and the log file validation options enabled

2: Use S3 server access logging on the bucket that houses the reports with the read and write management events and log file validation options enabled

3: Use AWS CloudTrail to create a new trail. Configure the trail to log read and write data events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation

4: Use AWS CloudTrail to create a new trail. Configure the trail to log read and write management events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation

Answer: 3

Explanation:

Amazon CloudTrail can be used to log activity on the reports. The key difference between the two answers that include CloudTrail is that one references data events whereas the other references management events.

Data events provide visibility into the resource operations performed on or within a resource. These are also known as data plane operations. Data events are often high-volume activities.

Example data events include:

- Amazon S3 object-level API activity (for example, GetObject, DeleteObject, and PutObject API operations).
- AWS Lambda function execution activity (the Invoke API).

Management events provide visibility into management operations that are performed on resources in your AWS account. These are also known as

control plane operations. Example management events include:

- Configuring security (for example, IAM AttachRolePolicy API operations)
- Registering devices (for example, Amazon EC2 CreateDefaultVpc API operations).

Therefore, to log data about access to the S3 objects the solutions architect should log read and write data events.

Log file validation can also be enabled on the destination bucket.

CORRECT: "Use AWS CloudTrail to create a new trail. Configure the trail to log read and write data events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation" is the correct answer.

INCORRECT: "Use AWS CloudTrail to create a new trail. Configure the trail to log read and write management events on the S3 bucket that houses the reports. Log these events to a new bucket, and enable log file validation" is incorrect as data events should be logged rather than management events.

INCORRECT: "Use S3 server access logging on the bucket that houses the reports with the read and write data events and the log file validation options enabled" is incorrect as server access logging does not have an option for choosing data events or log file validation.

INCORRECT: "Use S3 server access logging on the bucket that houses the reports with the read and write management events and log file validation options enabled" is incorrect as server access logging does not have an option for choosing management events or log file validation.

2. Question

A company operates a production web application that uses an Amazon RDS MySQL database. The database has automated, non-encrypted daily backups. To increase the security of the data, it has been recommended that encryption should be enabled for backups. Unencrypted backups will be destroyed after the first encrypted backup has been completed.

What should be done to enable encryption for future backups?

1: Enable default encryption for the Amazon S3 bucket where backups are stored

2: Modify the backup section of the database configuration to toggle the Enable encryption check box

3: Create a snapshot of the database. Copy it to an encrypted snapshot. Restore the database from the encrypted snapshot

4: Enable an encrypted read replica on RDS for MySQL. Promote the encrypted read replica to primary. Remove the original database instance

Answer: 3

Explanation:

Amazon RDS uses snapshots for backup. Snapshots are encrypted when created only if the database is encrypted and you can only select encryption for the database when you first create it. In this case the database, and hence the snapshots, ad unencrypted.

However, you can create an encrypted copy of a snapshot. You can restore using that snapshot which creates a new DB instance that has encryption enabled. From that point on encryption will be enabled for all snapshots.

CORRECT: "Create a snapshot of the database. Copy it to an encrypted snapshot. Restore the database from the encrypted snapshot" is the correct answer.

INCORRECT: "Enable an encrypted read replica on RDS for MySQL. Promote the encrypted read replica to primary. Remove the original database instance" is incorrect as you cannot create an encrypted read replica from an unencrypted master.

INCORRECT: "Modify the backup section of the database configuration to toggle the Enable encryption check box" is incorrect as you cannot add encryption for an existing database.

INCORRECT: "Enable default encryption for the Amazon S3 bucket where backups are stored" is incorrect because you do not have access to the S3 bucket in which snapshots are stored.

3. Question

A company has deployed an API in a VPC behind an internal Application Load Balancer (ALB). An application that consumes the API as a client is deployed in a second account in private subnets.

Which architectural configurations will allow the API to be consumed without using the public Internet? (Select TWO)

1: Configure a VPC peering connection between the two VPCs. Access the API using the private address

2: Configure an AWS Direct Connect connection between the two VPCs. Access the API using the private address

3: Configure a ClassicLink connection for the API into the client VPC. Access the API using the ClassicLink address

4: Configure a PrivateLink connection for the API into the client VPC. Access the API using the PrivateLink address

5: Configure an AWS Resource Access Manager connection between the two accounts. Access the API using the private address

Answer: 1,4

Explanation:

You can create your own application in your VPC and configure it as an AWS PrivateLink-powered service (referred to as an *endpoint service*). Other AWS principals can create a connection from their VPC to your endpoint service using an interface VPC endpoint . You are the *service provider* , and the AWS principals that create connections to your service are *service consumers* .

This configuration is powered by AWS PrivateLink and clients do not need to use an internet gateway, NAT device, VPN connection or AWS Direct Connect connection, nor do they require public IP addresses.

Another option is to use a VPC Peering connection. A VPC peering connection is a networking connection between two VPCs that enables you to route traffic between them using private IPv4 addresses or IPv6 addresses. Instances in either VPC can communicate with each other as if they are within the same network. You can create a VPC peering connection between your own VPCs, or with a VPC in another AWS account.

CORRECT: "Configure a VPC peering connection between the two VPCs. Access the API using the private address" is a correct answer.

CORRECT: "Configure a PrivateLink connection for the API into the client VPC. Access the API using the PrivateLink address" is also a correct answer.

INCORRECT: "Configure an AWS Direct Connect connection between the two VPCs. Access the API using the private address" is incorrect. Direct

Connect is used for connecting from on-premises data centers into AWS. It is not used from one VPC to another.

INCORRECT: "Configure a ClassicLink connection for the API into the client VPC. Access the API using the ClassicLink address" is incorrect. ClassicLink allows you to link EC2-Classic instances to a VPC in your account, within the same Region. This is not relevant to sending data between two VPCs.

INCORRECT: "Configure an AWS Resource Access Manager connection between the two accounts. Access the API using the private address" is incorrect. AWS RAM lets you share resources that are provisioned and managed in other AWS services. However, APIs are not shareable resources with AWS RAM.

4. Question

An application runs on Amazon EC2 Linux instances. The application generates log files which are written using standard API calls. A storage solution is required that can be used to store the files indefinitely and must allow concurrent access to all files.

Which storage service meets these requirements and is the MOST cost-effective?

1: Amazon EBS

2: Amazon EFS

3: Amazon EC2 instance store

4: Amazon S3

Answer: 4

Explanation:

The application is writing the files using API calls which means it will be compatible with Amazon S3 which uses a REST API. S3 is a massively scalable key-based object store that is well-suited to allowing concurrent access to the files from many instances.

Amazon S3 will also be the most cost-effective choice. A rough calculation using the AWS pricing calculator shows the cost differences between 1TB of storage on EBS, EFS, and S3 Standard.

CORRECT: "Amazon S3" is the correct answer.

INCORRECT: "Amazon EFS" is incorrect as though this does offer concurrent access from many EC2 Linux instances, it is not the most cost-effective solution.

INCORRECT: "Amazon EBS" is incorrect. The Elastic Block Store (EBS) is not a good solution for concurrent access from many EC2 instances and is not the most cost-effective option either. EBS volumes are mounted to a single instance except when using multi-attach which is a new feature and has several constraints.

INCORRECT: "Amazon EC2 instance store" is incorrect as this is an ephemeral storage solution which means the data is lost when powered down. Therefore, this is not an option for long-term data storage.

5. Question

A production application runs on an Amazon RDS MySQL DB instance. A solutions architect is building a new reporting tool that will access the same data. The reporting tool must be highly available and not impact the performance of the production application.

How can this be achieved?

1: Create a cross-region Multi-AZ deployment and create a read replica in the second region

2: Create a Multi-AZ RDS Read Replica of the production RDS DB instance

3: Use Amazon Data Lifecycle Manager to automatically create and manage snapshots

4: Create a Single-AZ RDS Read Replica of the production RDS DB instance. Create a second Single-AZ RDS Read Replica from the replica

Answer: 2

Explanation:

You can create a read replica as a Multi-AZ DB instance. Amazon RDS creates a standby of your replica in another Availability Zone for failover support for the replica. Creating your read replica as a Multi-AZ DB instance is independent of whether the source database is a Multi-AZ DB instance.

CORRECT: "Create a Multi-AZ RDS Read Replica of the production RDS DB instance" is the correct answer.

INCORRECT: "Create a Single-AZ RDS Read Replica of the production RDS DB instance. Create a second Single-AZ RDS Read Replica from the replica" is incorrect. Read replicas are primarily used for horizontal scaling. The best solution for high availability is to use a Multi-AZ read replica.

INCORRECT: "Create a cross-region Multi-AZ deployment and create a read replica in the second region" is incorrect as you cannot create a cross-region Multi-AZ deployment with RDS.

INCORRECT: "Use Amazon Data Lifecycle Manager to automatically create and manage snapshots" is incorrect as using snapshots is not the best solution for high availability.

6. Question

An online store uses an Amazon Aurora database. The database is deployed as a Multi-AZ deployment. Recently, metrics have shown that database read requests are high and causing performance issues which result in latency for write requests.

What should the solutions architect do to separate the read requests from the write requests?

1: Enable read through caching on the Amazon Aurora database

2: Update the application to read from the Multi-AZ standby instance

3: Create a read replica and modify the application to use the appropriate endpoint

4: Create a second Amazon Aurora database and link it to the primary database as a read replica

Answer: 2

Explanation:

Aurora Replicas are independent endpoints in an Aurora DB cluster, best used for scaling read operations and increasing availability. Up to 15 Aurora Replicas can be distributed across the Availability Zones that a DB cluster spans within an AWS Region.

The DB cluster volume is made up of multiple copies of the data for the DB cluster. However, the data in the cluster volume is represented as a single, logical volume to the primary instance and to Aurora Replicas in the DB cluster.

As well as providing scaling for reads, Aurora Replicas are also targets for multi-AZ. In this case the solutions architect can update the application to read from the Multi-AZ standby instance.

CORRECT: "Update the application to read from the Multi-AZ standby instance" is the correct answer.

INCORRECT: "Create a read replica and modify the application to use the appropriate endpoint" is incorrect. An Aurora Replica is both a standby in a Multi-AZ configuration and a target for read traffic. The architect simply needs to direct traffic to the Aurora Replica.

INCORRECT: "Enable read through caching on the Amazon Aurora database." is incorrect as this is not a feature of Amazon Aurora.

INCORRECT: "Create a second Amazon Aurora database and link it to the primary database as a read replica" is incorrect as an Aurora Replica already exists as this is a Multi-AZ configuration and the standby is an Aurora Replica that can be used for read traffic.

7. Question

An application is deployed on multiple AWS regions and accessed from around the world. The application exposes static public IP addresses. Some users are experiencing poor performance when accessing the application over the Internet.

What should a solutions architect recommend to reduce internet latency?

1: Set up AWS Global Accelerator and add endpoints

2: Set up AWS Direct Connect locations in multiple Regions

3: Set up an Amazon CloudFront distribution to access an application

4: Set up an Amazon Route 53 geoproximity routing policy to route traffic

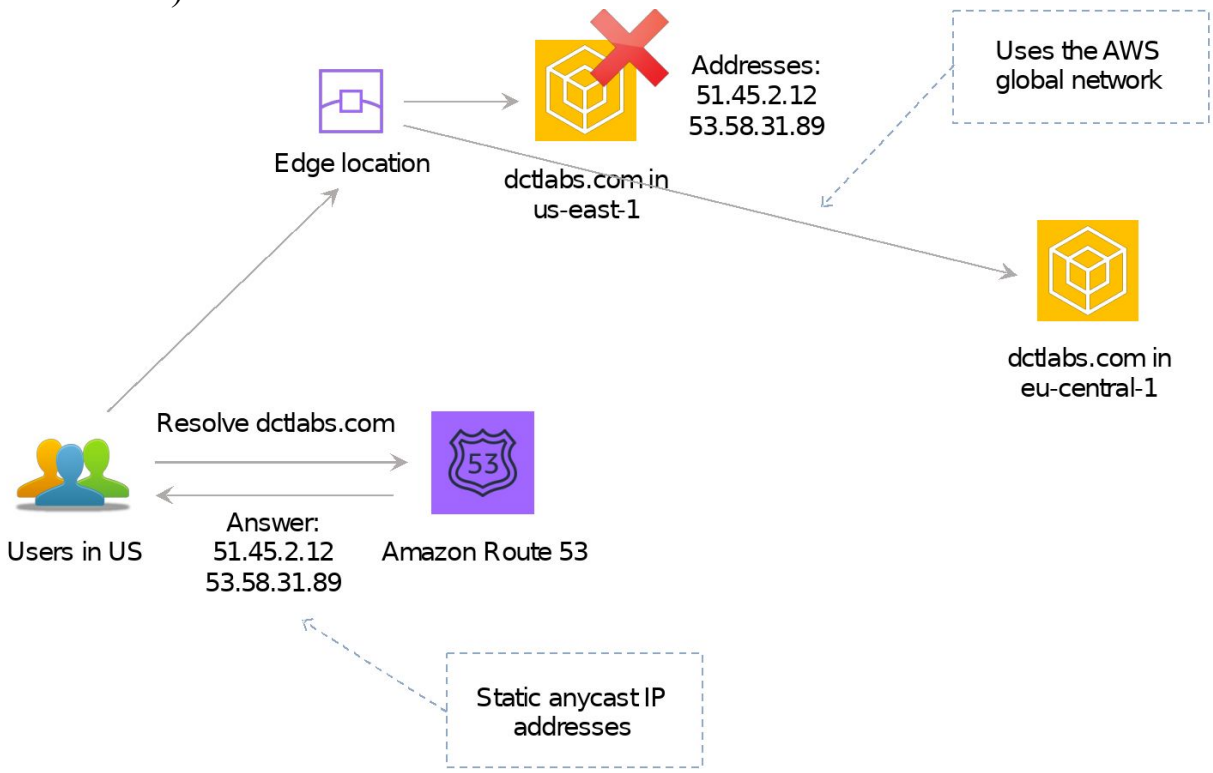
Answer: 1

Explanation:

AWS Global Accelerator is a service in which you create *accelerators* to improve availability and performance of your applications for local and global users. Global Accelerator directs traffic to optimal endpoints over the AWS global network. This improves the availability and performance of your internet applications that are used by a global audience. Global

Accelerator is a global service that supports endpoints in multiple AWS Regions, which are listed in the AWS Region Table.

By default, Global Accelerator provides you with two static IP addresses that you associate with your accelerator. (Or, instead of using the IP addresses that Global Accelerator provides, you can configure these entry points to be IPv4 addresses from your own IP address ranges that you bring to Global Accelerator.)



The static IP addresses are anycast from the AWS edge network and distribute incoming application traffic across multiple endpoint resources in multiple AWS Regions, which increases the availability of your applications. Endpoints can be Network Load Balancers, Application Load Balancers, EC2 instances, or Elastic IP addresses that are located in one AWS Region or multiple Regions.

CORRECT: "Set up AWS Global Accelerator and add endpoints" is the correct answer.

INCORRECT: "Set up AWS Direct Connect locations in multiple Regions" is incorrect as this is used to connect from an on-premises data center to AWS. It does not improve performance for users who are not connected to the on-premises data center.

INCORRECT: "Set up an Amazon CloudFront distribution to access an application" is incorrect as CloudFront cannot expose static public IP addresses.

INCORRECT: "Set up an Amazon Route 53 geoproximity routing policy to route traffic" is incorrect as this does not reduce internet latency as well as using Global Accelerator. GA will direct users to the closest edge location and then use the AWS global network.

8. Question

A new application will be launched on an Amazon EC2 instance with an Elastic Block Store (EBS) volume. A solutions architect needs to determine the most cost-effective storage option. The application will have infrequent usage, with peaks of traffic for a couple of hours in the morning and evening. Disk I/O is variable with peaks of up to 3,000 IOPS.

Which solution should the solutions architect recommend?

1: Amazon EBS Cold HDD (sc1)

2: Amazon EBS General Purpose SSD (gp2)

3: Amazon EBS Provisioned IOPS SSD (io1)

4: Amazon EBS Throughput Optimized HDD (st1)

Answer: 2

Explanation:

General Purpose SSD (gp2) volumes offer cost-effective storage that is ideal for a broad range of workloads. These volumes deliver single-digit millisecond latencies and the ability to burst to 3,000 IOPS for extended periods of time.

Between a minimum of 100 IOPS (at 33.33 GiB and below) and a maximum of 16,000 IOPS (at 5,334 GiB and above), baseline performance scales linearly at 3 IOPS per GiB of volume size. AWS designs gp2 volumes to deliver their provisioned performance 99% of the time. A gp2 volume can range in size from 1 GiB to 16 TiB.

In this case the volume would have a baseline performance of 3 x 200 = 600 IOPS. The volume could also burst to 3,000 IOPS for extended periods. As the I/O varies, this should be suitable.

CORRECT: "Amazon EBS General Purpose SSD (gp2)" is the correct answer.

INCORRECT: "Amazon EBS Provisioned IOPS SSD (io1) " is incorrect as this would be a more expensive option and is not required for the performance characteristics of this workload.

INCORRECT: "Amazon EBS Cold HDD (sc1)" is incorrect as there is no IOPS SLA for HDD volumes and they would likely not perform well enough for this workload.

INCORRECT: "Amazon EBS Throughput Optimized HDD (st1)" is incorrect as there is no IOPS SLA for HDD volumes and they would likely not perform well enough for this workload.

9. Question

A security team wants to limit access to specific services or actions in all of the team's AWS accounts. All accounts belong to a large organization in AWS Organizations. The solution must be scalable and there must be a single point where permissions can be maintained.

What should a solutions architect do to accomplish this?

1: Create an ACL to provide access to the services or actions

2: Create a security group to allow accounts and attach it to user groups

3: Create cross-account roles in each account to deny access to the services or actions

4: Create a service control policy in the root organizational unit to deny access to the services or actions

Answer: 4

Explanation:

Service control policies (SCPs) offer central control over the maximum available permissions for all accounts in your organization, allowing you to ensure your accounts stay within your organization's access control guidelines.

SCPs alone are not sufficient for allowing access in the accounts in your organization. Attaching an SCP to an AWS Organizations entity (root, OU, or account) defines a guardrail for what actions the principals can perform. You still need to attach identity-based or resource-based policies to

principals or resources in your organization's accounts to actually grant permissions to them.

CORRECT: "Create a service control policy in the root organizational unit to deny access to the services or actions" is the correct answer.

INCORRECT: "Create an ACL to provide access to the services or actions" is incorrect as access control lists are not used for permissions associated with IAM. Permissions policies are used with IAM.

INCORRECT: "Create a security group to allow accounts and attach it to user groups" is incorrect as security groups are instance level firewalls. They do not limit service actions.

INCORRECT: "Create cross-account roles in each account to deny access to the services or actions" is incorrect as this is a complex solution and does not provide centralized control

10. Question

A company is planning to use Amazon S3 to store documents uploaded by its customers. The images must be encrypted at rest in Amazon S3. The company does not want to spend time managing and rotating the keys, but it does want to control who can access those keys.

What should a solutions architect use to accomplish this?

1: Server-Side Encryption with keys stored in an S3 bucket

2: Server-Side Encryption with Customer-Provided Keys (SSE-C)

3: Server-Side Encryption with Amazon S3-Managed Keys (SSE-S3)

4: Server-Side Encryption with AWS KMS-Managed Keys (SSE-KMS)

Answer: 4

Explanation:

SSE-KMS requires that AWS manage the data key but you manage the customer master key (CMK) in AWS KMS. You can choose a customer managed CMK or the AWS managed CMK for Amazon S3 in your account.

Customer managed CMKs are CMKs in your AWS account that you create, own, and manage. You have full control over these CMKs, including establishing and maintaining their key policies, IAM policies, and grants, enabling and disabling them, rotating their cryptographic material, adding

tags , creating aliases that refer to the CMK, and scheduling the CMKs for deletion .

For this scenario, the solutions architect should use SSE-KMS with a customer managed CMK. That way KMS will manage the data key but the company can configure key policies defining who can access the keys.

CORRECT: "Server-Side Encryption with AWS KMS-Managed Keys (SSE-KMS)" is the correct answer.

INCORRECT: "Server-Side Encryption with keys stored in an S3 bucket" is incorrect as you cannot store your keys in a bucket with server-side encryption

INCORRECT: "Server-Side Encryption with Customer-Provided Keys (SSE-C)" is incorrect as the company does not want to manage the keys.

INCORRECT: "Server-Side Encryption with Amazon S3-Managed Keys (SSE-S3)" is incorrect as the company needs to manage access control for the keys which is not possible when they're managed by Amazon.

11. Question

A company has some statistical data stored in an Amazon RDS database. The company want to allow users to access this information using an API. A solutions architect must create a solution that allows sporadic access to the data, ranging from no requests to large bursts of traffic.

Which solution should the solutions architect suggest?

1: Set up an Amazon API Gateway and use Amazon ECS

2: Set up an Amazon API Gateway and use AWS Elastic Beanstalk

3: Set up an Amazon API Gateway and use AWS Lambda functions

4: Set up an Amazon API Gateway and use Amazon EC2 with Auto Scaling

Answer: 3

Explanation:

This question is simply asking you to work out the best compute service for the stated requirements. The key requirements are that the compute service should be suitable for a workload that can range quite broadly in demand from no requests to large bursts of traffic.

AWS Lambda is an ideal solution as you pay only when requests are made and it can easily scale to accommodate the large bursts in traffic. Lambda works well with both API Gateway and Amazon RDS.

CORRECT: "Set up an Amazon API Gateway and use AWS Lambda functions" is the correct answer.

INCORRECT: "Set up an Amazon API Gateway and use Amazon ECS" is incorrect

INCORRECT: "Set up an Amazon API Gateway and use AWS Elastic Beanstalk" is incorrect

INCORRECT: "Set up an Amazon API Gateway and use Amazon EC2 with Auto Scaling" is incorrect

12. Question

A company runs a financial application using an Amazon EC2 Auto Scaling group behind an Application Load Balancer (ALB). When running month-end reports on a specific day and time each month the application becomes unacceptably slow. Amazon CloudWatch metrics show the CPU utilization hitting 100%.

What should a solutions architect recommend to ensure the application is able to handle the workload and avoid downtime?

1: Configure an Amazon CloudFront distribution in front of the ALB

2: Configure an EC2 Auto Scaling simple scaling policy based on CPU utilization

3: Configure an EC2 Auto Scaling scheduled scaling policy based on the monthly schedule

4: Configure Amazon ElastiCache to remove some of the workload from the EC2 instances

Answer: 3

Explanation:

Scheduled scaling allows you to set your own scaling schedule. In this case the scaling action can be scheduled to occur just prior to the time that the reports will be run each month. Scaling actions are performed automatically as a function of time and date. This will ensure that there are enough EC2 instances to serve the demand and prevent the application from slowing down.

CORRECT: "Configure an EC2 Auto Scaling scheduled scaling policy based on the monthly schedule" is the correct answer.

INCORRECT: "Configure an Amazon CloudFront distribution in front of the ALB" is incorrect as this would be more suitable for providing access to global users by caching content.

INCORRECT: "Configure an EC2 Auto Scaling simple scaling policy based on CPU utilization" is incorrect as this would not prevent the slow-down from occurring as there would be a delay between when the CPU hits 100% and the metric being reported and additional instances being launched.

INCORRECT: "Configure Amazon ElastiCache to remove some of the workload from the EC2 instances" is incorrect as ElastiCache is a database cache, it cannot replace the compute functions of an EC2 instance.

13. Question

A solutions architect is designing a high performance computing (HPC) application using Amazon EC2 Linux instances. All EC2 instances need to communicate to each other with low latency and high throughput network performance.

Which EC2 solution BEST meets these requirements?

1: Launch the EC2 instances in a cluster placement group in one Availability Zone

2: Launch the EC2 instances in a spread placement group in one Availability Zone

3: Launch the EC2 instances in an Auto Scaling group in two Regions. Place a Network Load Balancer in front of the instances

4: Launch the EC2 instances in an Auto Scaling group spanning multiple Availability Zones

Answer: 1

Explanation:

When you launch a new EC2 instance, the EC2 service attempts to place the instance in such a way that all of your instances are spread out across underlying hardware to minimize correlated failures. You can use *placement groups* to influence the placement of a group of *interdependent* instances to meet the needs of your workload. Depending on the type of workload, you

can create a placement group using one of the following placement strategies:

- *Cluster* – packs instances close together inside an Availability Zone. This strategy enables workloads to achieve the low-latency network performance necessary for tightly-coupled node-to-node communication that is typical of HPC applications.
- *Partition* – spreads your instances across logical partitions such that groups of instances in one partition do not share the underlying hardware with groups of instances in different partitions. This strategy is typically used by large distributed and replicated workloads, such as Hadoop, Cassandra, and Kafka.
- *Spread* – strictly places a small group of instances across distinct underlying hardware to reduce correlated failures.

For this scenario, a cluster placement group should be used as this is the best option for providing low-latency network performance for a HPC application.

CORRECT: "Launch the EC2 instances in a cluster placement group in one Availability Zone" is the correct answer.

INCORRECT: "Launch the EC2 instances in a spread placement group in one Availability Zone" is incorrect as the spread placement group is used to spread instances across distinct underlying hardware.

INCORRECT: "Launch the EC2 instances in an Auto Scaling group in two Regions. Place a Network Load Balancer in front of the instances" is incorrect as this does not achieve the stated requirement to provide low-latency, high throughput network performance between instances. Also, you cannot use an ELB across Regions.

INCORRECT: "Launch the EC2 instances in an Auto Scaling group spanning multiple Availability Zones" is incorrect as this does not reduce network latency or improve performance.

14. Question

A web application in a three-tier architecture runs on a fleet of Amazon EC2 instances. Performance issues have been reported and investigations point to insufficient swap space. The operations team requires monitoring to determine if this is correct.

What should a solutions architect recommend?

1: Configure an Amazon CloudWatch SwapUsage metric dimension. Monitor the SwapUsage dimension in the EC2 metrics in CloudWatch

2: Use EC2 metadata to collect information, then publish it to Amazon CloudWatch custom metrics. Monitor SwapUsage metrics in CloudWatch

3: Install an Amazon CloudWatch agent on the instances. Run an appropriate script on a set schedule. Monitor SwapUtilization metrics in CloudWatch

4: Enable detailed monitoring in the EC2 console. Create an Amazon CloudWatch SwapUtilization custom metric. Monitor SwapUtilization metrics in CloudWatch

Answer: 3

Explanation:

You can use the CloudWatch agent to collect both system metrics and log files from Amazon EC2 instances and on-premises servers. The agent supports both Windows Server and Linux, and enables you to select the metrics to be collected, including sub-resource metrics such as per-CPU core.

There is now a unified agent and previously there were monitoring scripts. Both of these tools can capture SwapUtilization metrics and send them to CloudWatch. This is the best way to get memory utilization metrics from Amazon EC2 instnaces.

CORRECT: "Install an Amazon CloudWatch agent on the instances. Run an appropriate script on a set schedule. Monitor SwapUtilization metrics in CloudWatch" is the correct answer.

INCORRECT: "Enable detailed monitoring in the EC2 console. Create an Amazon CloudWatch SwapUtilization custom metric. Monitor SwapUtilization metrics in CloudWatch" is incorrect as you do not create custom metrics in the console, you must configure the instances to send the metric information to CloudWatch.

INCORRECT: "Configure an Amazon CloudWatch SwapUsage metric dimension. Monitor the SwapUsage dimension in the EC2 metrics in CloudWatch" is incorrect as there is no SwapUsage metric in CloudWatch. All memory metrics must be custom metrics.

INCORRECT: "Use EC2 metadata to collect information, then publish it to Amazon CloudWatch custom metrics. Monitor SwapUsage metrics in

CloudWatch" is incorrect as performance related information is not stored in metadata.

15. Question

A gaming company collects real-time data and stores it in an on-premises database system. The company are migrating to AWS and need better performance for the database. A solutions architect has been asked to recommend an in-memory database that supports data replication.

Which database should a solutions architect recommend?

1: Amazon RDS for MySQL

2: Amazon RDS for PostgreSQL

3: Amazon ElastiCache for Redis

4: Amazon ElastiCache for Memcached

Answer: 3

Explanation:

Amazon ElastiCache is an in-memory database. With ElastiCache Memcached there is no data replication or high availability. The Redis engine must be used which does support both data replication and clustering.

CORRECT: "Amazon ElastiCache for Redis" is the correct answer.

INCORRECT: "Amazon ElastiCache for Memcached" is incorrect as Memcached does not support data replication or high availability.

INCORRECT: "Amazon RDS for MySQL" is incorrect as this is not an in-memory database.

INCORRECT: "Amazon RDS for PostgreSQL" is incorrect as this is not an in-memory database.

16. Question

A company has experienced malicious traffic from some suspicious IP addresses. The security team discovered the requests are from different IP addresses under the same CIDR range.

What should a solutions architect recommend to the team?

1: Add a rule in the inbound table of the security group to deny the traffic from that CIDR range

2: Add a rule in the outbound table of the security group to deny the traffic from that CIDR range

3: Add a deny rule in the inbound table of the network ACL with a lower rule number than other rules

4: Add a deny rule in the outbound table of the network ACL with a lower rule number than other rules

Answer: 3

Explanation:

You can only create deny rules with network ACLs, it is not possible with security groups. Network ACLs process rules in order from the lowest numbered rules to the highest until they reach and allow or deny.

The solutions architect should add a deny rule in the inbound table of the network ACL with a lower rule number than other rules.

CORRECT: "Add a deny rule in the inbound table of the network ACL with a lower rule number than other rules" is the correct answer.

INCORRECT: "Add a deny rule in the outbound table of the network ACL with a lower rule number than other rules" is incorrect as this will only block outbound traffic.

INCORRECT: "Add a rule in the inbound table of the security group to deny the traffic from that CIDR range" is incorrect as you cannot create a deny rule with a security group.

INCORRECT: "Add a rule in the outbound table of the security group to deny the traffic from that CIDR range" is incorrect as you cannot create a deny rule with a security group.

17. Question

A solutions architect is designing a microservices architecture. AWS Lambda will store data in an Amazon DynamoDB table named Orders. The solutions architect needs to apply an IAM policy to the Lambda function's execution role to allow it to put, update, and delete items in the Orders table. No other actions should be allowed.

Which of the following code snippets should be included in the IAM policy to fulfill this requirement whilst providing the LEAST privileged access?

1:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

2:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/*"

3:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

4:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Deny",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

Answer: 1
Explanation:

The key requirements are to allow the Lambda function the put, update, and delete actions on a single table. Using the principle of least privilege the answer should not allow any other access.

CORRECT: The following answer is correct:

"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

This code snippet specifies the exact actions to allow and also specified the resource to apply those permissions to.

INCORRECT: the following answer is incorrect:

"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": [
"dynamodb:PutItem",
"dynamodb:UpdateItem",
"dynamodb:DeleteItem"
],
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/*"

This code snippet specifies the correct list of actions but it provides a wildcard “*” instead of specifying the exact resource. Therefore, the function will be able to put, update, and delete items on any table in the account.

INCORRECT: the following answer is incorrect:

"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Allow",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"

This code snippet allows any action on DynamoDB by using a wildcard “dynamodb:*”. This does not follow the principle of least privilege.

INCORRECT: the following answer is incorrect:
"Sid": "PutUpdateDeleteOnOrders",
"Effect": "Deny",
"Action": "dynamodb:* ",
"Resource": "arn:aws:dynamodb:us-east-1:227392126428:table/Orders"
This code snippet denies any action on the table. This does not have the desired effect.

18. Question

A company has created a duplicate of its environment in another AWS Region. The application is running in warm standby mode. There is an Application Load Balancer (ALB) in front of the application. Currently, failover is manual and requires updating a DNS alias record to point to the secondary ALB.

How can a solutions architect automate the failover process?

1: Enable an ALB health check

2: Enable an Amazon Route 53 health check

3: Create a CNAME record on Amazon Route 53 pointing to the ALB endpoint

4: Create a latency based routing policy on Amazon Route 53

Answer: 2

Explanation:

You can use Route 53 to check the health of your resources and only return healthy resources in response to DNS queries. There are three types of DNS failover configurations:

1. Active-passive: Route 53 actively returns a primary resource. In case of failure, Route 53 returns the backup resource. Configured using a failover policy.
2. Active-active: Route 53 actively returns more than one resource. In case of failure, Route 53 fails back to the healthy resource. Configured using any routing policy besides failover.
3. Combination: Multiple routing policies (such as latency-based, weighted, etc.) are combined into a tree to configure more complex DNS failover.

In this case an alias already exists for the secondary ALB. Therefore, the solutions architect just needs to enable a failover configuration with an Amazon Route 53 health check.

CORRECT: "Enable an Amazon Route 53 health check" is the correct answer.

INCORRECT: "Enable an ALB health check" is incorrect. The point of an ALB health check is to identify the health of targets (EC2 instances). It cannot redirect clients to another Region.

INCORRECT: "Create a CNAME record on Amazon Route 53 pointing to the ALB endpoint" is incorrect as an Alias record already exists and is better for mapping to an ALB.

INCORRECT: "Create a latency based routing policy on Amazon Route 53" is incorrect as this will only take into account latency, it is not used for failover.

19. Question

An application allows users to upload and download files. Files older than 2 years will be accessed less frequently. A solutions architect needs to ensure that the application can scale to any number of files while maintaining high availability and durability.

Which scalable solutions should the solutions architect recommend?

1: Store the files on Amazon S3 with a lifecycle policy that moves objects older than 2 years to S3 Standard Infrequent Access (S3 Standard-IA)

2: Store the files on Amazon Elastic File System (EFS) with a lifecycle policy that moves objects older than 2 years to EFS Infrequent Access (EFS IA)

3: Store the files in Amazon Elastic Block Store (EBS) volumes. Schedule snapshots of the volumes. Use the snapshots to archive data older than 2 years

4: Store the files in Amazon Elastic Block Store (EBS) volumes. Create a lifecycle policy to move files older than 2 years to Amazon S3 Glacier

Answer: 1

Explanation:

S3 Standard-IA is for data that is accessed less frequently, but requires rapid access when needed. S3 Standard-IA offers the high durability, high

throughput, and low latency of S3 Standard, with a low per GB storage price and per GB retrieval fee. This combination of low cost and high performance make S3 Standard-IA ideal for long-term storage, backups, and as a data store for disaster recovery files.

CORRECT: "Store the files on Amazon S3 with a lifecycle policy that moves objects older than 2 years to S3 Standard Infrequent Access (S3 Standard-IA)" is the correct answer.

INCORRECT: "Store the files on Amazon Elastic File System (EFS) with a lifecycle policy that moves objects older than 2 years to EFS Infrequent Access (EFS IA)" is incorrect. With EFS you can transition files to EFS IA after a file has not been accessed for a specified period of time with options up to 90 days. You cannot transition based on an age of 2 years.

INCORRECT: "Store the files in Amazon Elastic Block Store (EBS) volumes. Schedule snapshots of the volumes. Use the snapshots to archive data older than 2 years" is incorrect. You cannot identify the age of data and archive snapshots in this way with EBS.

INCORRECT: "Store the files in Amazon Elastic Block Store (EBS) volumes. Create a lifecycle policy to move files older than 2 years to Amazon S3 Glacier" is incorrect. You cannot archive files from an EBS volume to Glacier using lifecycle policies.

20. Question

A company is planning to migrate a large quantity of important data to Amazon S3. The data will be uploaded to a versioning enabled bucket in the us-west-1 Region. The solution needs to include replication of the data to another Region for disaster recovery purposes.

How should a solutions architect configure the replication?

1: Create an additional S3 bucket in another Region and configure cross-Region replication

2: Create an additional S3 bucket in another Region and configure cross-origin resource sharing (CORS)

3: Create an additional S3 bucket with versioning in another Region and configure cross-Region replication

4: Create an additional S3 bucket with versioning in another Region and configure cross-origin resource sharing (CORS)

Answer: 3

Explanation:

Replication enables automatic, asynchronous copying of objects across Amazon S3 buckets. Buckets that are configured for object replication can be owned by the same AWS account or by different accounts. You can copy objects between different AWS Regions or within the same Region. Both source and destination buckets must have versioning enabled.

CORRECT: "Create an additional S3 bucket with versioning in another Region and configure cross-Region replication" is the correct answer.

INCORRECT: "Create an additional S3 bucket in another Region and configure cross-Region replication" is incorrect as the destination bucket must also have versioning enabled.

INCORRECT: "Create an additional S3 bucket in another Region and configure cross-origin resource sharing (CORS)" is incorrect as CORS is not related to replication.

INCORRECT: "Create an additional S3 bucket with versioning in another Region and configure cross-origin resource sharing (CORS)" is incorrect as CORS is not related to replication.

21. Question

An application runs on Amazon EC2 instances across multiple Availability Zones. The instances run in an Amazon EC2 Auto Scaling group behind an Application Load Balancer. The application performs best when the CPU utilization of the EC2 instances is at or near 40%.

What should a solutions architect do to maintain the desired performance across all instances in the group?

1: Use a simple scaling policy to dynamically scale the Auto Scaling group

2: Use a target tracking policy to dynamically scale the Auto Scaling group

3: Use an AWS Lambda function to update the desired Auto Scaling group capacity

4: Use scheduled scaling actions to scale up and scale down the Auto Scaling group

Answer: 2

Explanation:

With target tracking scaling policies, you select a scaling metric and set a target value. Amazon EC2 Auto Scaling creates and manages the CloudWatch alarms that trigger the scaling policy and calculates the scaling adjustment based on the metric and the target value.

The scaling policy adds or removes capacity as required to keep the metric at, or close to, the specified target value. In addition to keeping the metric close to the target value, a target tracking scaling policy also adjusts to the changes in the metric due to a changing load pattern.

CORRECT: "Use a target tracking policy to dynamically scale the Auto Scaling group" is the correct answer.

INCORRECT: "Use a simple scaling policy to dynamically scale the Auto Scaling group" is incorrect as target tracking is a better way to keep the aggregate CPU usage at around 40%

INCORRECT: "Use an AWS Lambda function to update the desired Auto Scaling group capacity" is incorrect as this can be done automatically.

INCORRECT: "Use scheduled scaling actions to scale up and scale down the Auto Scaling group" is incorrect as dynamic scaling is required to respond to changes in utilization.

22. Question

A High Performance Computing (HPC) application needs storage that can provide 135,000 IOPS. The storage layer is replicated across all instances in a cluster.

What is the optimal storage solution that provides the required performance and is cost-effective?

1: Use Amazon EBS Provisioned IOPS volume with 135,000 IOPS

2: Use Amazon Instance Store

3: Use Amazon S3 with byte-range fetch

4: Use Amazon EC2 Enhanced Networking with an EBS HDD Throughput Optimized volume

Answer: 2

Explanation:

Instance stores offer very high performance and low latency. As long as you can afford to lose an instance, i.e. you are replicating your data, these can be a good solution for high performance/low latency requirements. Also, the

cost of instance stores is included in the instance charges so it can also be more cost-effective than EBS Provisioned IOPS.

CORRECT: "Use Amazon Instance Store" is the correct answer.

INCORRECT: "Use Amazon EBS Provisioned IOPS volume with 135,000 IOPS" is incorrect. In the case of a HPC cluster that replicates data between nodes you don't necessarily need a shared storage solution such as Amazon EBS Provisioned IOPS – this would also be a more expensive solution as the Instance Store is included in the cost of the HPC instance.

INCORRECT: "Use Amazon S3 with byte-range fetch" is incorrect. Amazon S3 is not a solution for this HPC application as in this case it will require block-based storage to provide the required IOPS.

INCORRECT: "Enhanced networking provides higher bandwidth and lower latency and is implemented using an Elastic Network Adapter (ENA). However, using an ENA with an HDD Throughput Optimized volume is not recommended and the volume will not provide the performance required for this use case." is incorrect

23. Question

A high-performance file system is required for a financial modelling application. The data set will be stored on Amazon S3 and the storage solution must have seamless integration so objects can be accessed as files.

Which storage solution should be used?

1: Amazon FSx for Windows File Server

2: Amazon FSx for Lustre

3: Amazon Elastic File System (EFS)

4: Amazon Elastic Block Store (EBS)

Answer: 2

Explanation:

Amazon FSx for Lustre provides a high-performance file system optimized for fast processing of workloads such as machine learning, high performance computing (HPC), video processing, financial modeling, and electronic design automation (EDA). Amazon FSx works natively with Amazon S3, letting you transparently access your S3 objects as files on Amazon FSx to run analyses for hours to months.

CORRECT: "Amazon FSx for Lustre" is the correct answer.

INCORRECT: "Amazon FSx for Windows File Server" is incorrect. Amazon FSx for Windows File Server provides a fully managed native Microsoft Windows file system so you can easily move your Windows-based applications that require shared file storage to AWS. This solution integrates with Windows file shares, not with Amazon S3.

INCORRECT: "Amazon Elastic File System (EFS)" is incorrect. EFS and EBS are not good use cases for this solution. Neither storage solution is capable of presenting Amazon S3 objects as files to the application.

INCORRECT: "Amazon Elastic Block Store (EBS)" is incorrect. EFS and EBS are not good use cases for this solution. Neither storage solution is capable of presenting Amazon S3 objects as files to the application.

24. Question

An application requires a MySQL database which will only be used several times a week for short periods. The database needs to provide automatic instantiation and scaling. Which database service is most suitable?

1: Amazon RDS MySQL

2: Amazon EC2 instance with MySQL database installed

3: Amazon Aurora

4: Amazon Aurora Serverless

Answer: 4

Explanation:

Amazon Aurora Serverless is an on-demand, auto-scaling configuration for Amazon Aurora. The database automatically starts up, shuts down, and scales capacity up or down based on application needs. This is an ideal database solution for infrequently-used applications.

CORRECT: "Amazon Aurora Serverless" is the correct answer.

INCORRECT: "Amazon RDS MySQL" is incorrect as this service requires an instance to be running all the time which is more costly.

INCORRECT: "Amazon EC2 instance with MySQL database installed" is incorrect as this service requires an instance to be running all the time which is more costly.

INCORRECT: "Amazon Aurora" is incorrect as this service requires an instance to be running all the time which is more costly.

25. Question

An Architect needs to find a way to automatically and repeatably create many member accounts within an AWS Organization. The accounts also need to be moved into an OU and have VPCs and subnets created.

What is the best way to achieve this?

1: Use the AWS Organizations API

2: Use CloudFormation with scripts

3: Use the AWS Management Console

4: Use the AWS CLI

Answer: 2

Explanation:

The best solution is to use a combination of scripts and AWS CloudFormation. You will also leverage the AWS Organizations API. This solution can provide all of the requirements.

CORRECT: "Use CloudFormation with scripts" is the correct answer.

INCORRECT: "Use the AWS Organizations API" is incorrect. You can create member accounts with the AWS Organizations API. However, you cannot use that API to configure the account and create VPCs and subnets.

INCORRECT: "Use the AWS Management Console" is incorrect. Using the AWS Management Console is not a method of automatically creating the resources.

INCORRECT: "Use the AWS CLI" is incorrect. You can do all tasks using the AWS CLI but it is better to automate the process using AWS CloudFormation.

26. Question

An organization is extending a secure development environment into AWS. They have already secured the VPC including removing the Internet Gateway and setting up a Direct Connect connection. What else needs to be done to add encryption?

1: Setup a Virtual Private Gateway (VPG)

2: Enable IPSec encryption on the Direct Connect connection
3: Setup the Border Gateway Protocol (BGP) with encryption
4: Configure an AWS Direct Connect Gateway

Answer: 1

Explanation:

A VPG is used to setup an AWS VPN which you can use in combination with Direct Connect to encrypt all data that traverses the Direct Connect link. This combination provides an IPsec-encrypted private connection that also reduces network costs, increases bandwidth throughput, and provides a more consistent network experience than internet-based VPN connections.

CORRECT: "Setup a Virtual Private Gateway (VPG)" is the correct answer.

INCORRECT: "Enable IPSec encryption on the Direct Connect connection" is incorrect. There is no option to enable IPSec encryption on the Direct Connect connection.

INCORRECT: "Setup the Border Gateway Protocol (BGP) with encryption" is incorrect. The BGP protocol is not used to enable encryption for Direct Connect, it is used for routing.

INCORRECT: "Configure an AWS Direct Connect Gateway" is incorrect. An AWS Direct Connect Gateway is used to connect to VPCs across multiple AWS regions. It is not involved with encryption.

27. Question

A shared services VPC is being setup for use by several AWS accounts. An application needs to be securely shared from the shared services VPC. The solution should not allow consumers to connect to other instances in the VPC.

How can this be setup with the least administrative effort? (Select TWO)

1: Create a Network Load Balancer (NLB)
2: Use AWS PrivateLink to expose the application as an endpoint service
3: Use AWS ClassicLink to expose the application as an endpoint service
4: Setup VPC peering between each AWS VPC
5: Configure security groups to restrict access

Answer: 1,2

Explanation:

VPCs can be shared among multiple AWS accounts. Resources can then be shared amongst those accounts. However, to restrict access so that consumers cannot connect to other instances in the VPC the best solution is to use PrivateLink to create an endpoint for the application. The endpoint type will be an interface endpoint and it uses an NLB in the shared services VPC.

CORRECT: "Create a Network Load Balancer (NLB)" is a correct answer.

CORRECT: "Use AWS PrivateLink to expose the application as an endpoint service" is also a correct answer.

INCORRECT: "Use AWS ClassicLink to expose the application as an endpoint service" is incorrect. ClassicLink allows you to link EC2-Classic instances to a VPC in your account, within the same region. This solution does not include EC2-Classic which is now deprecated (replaced by VPC).

INCORRECT: "Setup VPC peering between each AWS VPC" is incorrect. VPC peering could be used along with security groups to restrict access to the application and other instances in the VPC. However, this would be administratively difficult as you would need to ensure that you maintain the security groups as resources and addresses change.

INCORRECT: "Configure security groups to restrict access" is incorrect. This could be used in conjunction with VPC peering but better method is to use PrivateLink for this use case.

28. Question

A web app allows users to upload images for viewing online. The compute layer that processes the images is behind an Auto Scaling group. The processing layer should be decoupled from the front end and the ASG needs to dynamically adjust based on the number of images being uploaded.

How can this be achieved?

1: Create an Amazon SNS Topic to generate a notification each time a message is uploaded. Have the ASG scale based on the number of SNS messages

2: Create a target tracking policy that keeps the ASG at 70% CPU utilization

3: Create an Amazon SQS queue and custom CloudWatch metric to measure the number of messages in the queue. Configure the ASG to scale based on the number of messages in the queue

4: Create a scheduled policy that scales the ASG at times of expected peak load

Answer: 3

Explanation:

The best solution is to use Amazon SQS to decouple the front end from the processing compute layer. To do this you can create a custom CloudWatch metric that measures the number of messages in the queue and then configure the ASG to scale using a target tracking policy that tracks a certain value.

CORRECT: "Create an Amazon SQS queue and custom CloudWatch metric to measure the number of messages in the queue. Configure the ASG to scale based on the number of messages in the queue" is the correct answer.

INCORRECT: "Create an Amazon SNS Topic to generate a notification each time a message is uploaded. Have the ASG scale based on the number of SNS messages" is incorrect. The Amazon Simple Notification Service (SNS) is used for sending notifications using topics. Amazon SQS is a better solution for this scenario as it provides a decoupling mechanism where the actual images can be stored for processing. SNS does not provide somewhere for the images to be stored.

INCORRECT: "Create a target tracking policy that keeps the ASG at 70% CPU utilization" is incorrect. Using a target tracking policy with the ASG that tracks CPU utilization does not allow scaling based on the number of images being uploaded.

INCORRECT: "Create a scheduled policy that scales the ASG at times of expected peak load" is incorrect. Using a scheduled policy is less dynamic as though you may be able to predict usage patterns, it would be better to adjust dynamically based on actual usage.

29. Question

A web application is running on a fleet of Amazon EC2 instances using an Auto Scaling Group. It is desired that the CPU usage in the fleet is

kept at 40%.

How should scaling be configured?

1: Use a simple scaling policy that launches instances when the average CPU hits 40%

2: Use a target tracking policy that keeps the average aggregate CPU utilization at 40%

3: Use a step scaling policy that uses the PercentChangeInCapacity value to adjust the group size as required

4: Use a custom CloudWatch alarm to monitor CPU usage and notify the ASG using Amazon SNS

Answer: 2

Explanation:

This is a perfect use case for a target tracking scaling policy. With target tracking scaling policies, you select a scaling metric and set a target value. In this case you can just set the target value to 40% average aggregate CPU utilization.

CORRECT: "Use a target tracking policy that keeps the average aggregate CPU utilization at 40%" is the correct answer.

INCORRECT: "Use a simple scaling policy that launches instances when the average CPU hits 40%" is incorrect. A simple scaling policy will add instances when 40% CPU utilization is reached, but it is not designed to maintain 40% CPU utilization across the group.

INCORRECT: "Use a step scaling policy that uses the PercentChangeInCapacity value to adjust the group size as required" is incorrect. The step scaling policy makes scaling adjustments based on a number of factors. The PercentChangeInCapacity value increments or decrements the group size by a specified percentage. This does not relate to CPU utilization.

INCORRECT: "Use a custom CloudWatch alarm to monitor CPU usage and notify the ASG using Amazon SNS" is incorrect. You do not need to create a custom Amazon CloudWatch alarm as the ASG can scale using a policy based on CPU utilization using standard configuration.

30. Question

Health related data in Amazon S3 needs to be frequently accessed for up to 90 days. After that time the data must be retained for compliance reasons for seven years and is rarely accessed.

Which storage classes should be used?

1: Store data in STANDARD for 90 days then transition the data to DEEP_ARCHIVE

2: Store data in INTELLIGENT_TIERING for 90 days then transition to STANDARD_IA

3: Store data in STANDARD for 90 days then expire the data

4: Store data in STANDARD for 90 days then transition to REDUCED_REDUNDANCY

Answer: 1

Explanation:

In this case the data is frequently accessed so must be stored in standard for the first 90 days. After that the data is still to be kept for compliance reasons but is rarely accessed so is a good use case for DEEP_ARCHIVE.

CORRECT: "Store data in STANDARD for 90 days then transition the data to DEEP_ARCHIVE" is the correct answer.

INCORRECT: "Store data in INTELLIGENT_TIERING for 90 days then transition to STANDARD_IA" is incorrect. You cannot transition from INTELLIGENT_TIERING to STANDARD_IA.

INCORRECT: "Store data in STANDARD for 90 days then expire the data" is incorrect. Expiring the data is not possible as it must be retained for compliance.

INCORRECT: "Store data in STANDARD for 90 days then transition to REDUCED_REDUNDANCY" is incorrect. You cannot transition from any storage class to REDUCED_REDUNDANCY.

31. Question

An e-commerce web application needs a highly scalable key-value database. Which AWS database service should be used?

1: Amazon RDS

2: Amazon RedShift

3: Amazon DynamoDB

4: Amazon ElastiCache

Answer: 3

Explanation:

A key-value database is a type of nonrelational (NoSQL) database that uses a simple key-value method to store data. A key-value database stores data as a collection of key-value pairs in which a key serves as a unique identifier. Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability – this is the best database for these requirements.

CORRECT: "Amazon DynamoDB" is the correct answer.

INCORRECT: "Amazon RDS" is incorrect. Amazon RDS is a relational (SQL) type of database, not a key-value / nonrelational database.

INCORRECT: "Amazon RedShift" is incorrect. Amazon RedShift is a data warehouse service used for online analytics processing (OLAP) workloads.

INCORRECT: "Amazon ElastiCache" is incorrect. Amazon ElastiCache is an in-memory caching database. This is not a nonrelational key-value database.

32. Question

You work for Digital Cloud Training and have just created a number of IAM users in your AWS account. You need to ensure that the users are able to make API calls to AWS services. What else needs to be done?

1: Enable Multi-Factor Authentication for the users

2: Create a set of Access Keys for the users

3: Set a password for each user

4: Create a group and add the users to it

Answer: 2

Explanation:

Access keys are a combination of an access key ID and a secret access key and you can assign two active access keys to a user at a time. These can be used to make programmatic calls to AWS when using the API in program code or at a command prompt when using the AWS CLI or the AWS PowerShell tools.

CORRECT: "Create a set of Access Keys for the users" is the correct answer.

INCORRECT: "Enable Multi-Factor Authentication for the users" is incorrect. Multi-factor authentication can be used to control access to AWS service APIs but the question is not asking how to better secure the calls but just being able to make them.

INCORRECT: "Set a password for each user" is incorrect. A password is needed for logging into the console but not for making API calls to AWS services. Similarly you don't need to create a group and add the users to it to provide access to make API calls to AWS services.

INCORRECT: "Create a group and add the users to it" is incorrect as you need access keys for programmatic access using the API.

33. Question

A Solutions Architect is migrating a small relational database into AWS. The database will run on an EC2 instance and the DB size is around 500 GB. The database is infrequently used with small amounts of requests spread across the day. The DB is a low priority and the Architect needs to lower the cost of the solution.

What is the MOST cost-effective storage type?

1: Amazon EBS Provisioned IOPS SSD

2: Amazon EFS

3: Amazon EBS Throughput Optimized HDD

4: Amazon EBS General Purpose SSD

Answer: 3

Explanation:

Throughput Optimized HDD is the most cost-effective storage option and for a small DB with low traffic volumes it may be sufficient. Note that the volume must be at least 500 GB in size.

CORRECT: "Amazon EBS Throughput Optimized HDD" is the correct answer.

INCORRECT: "Amazon EBS Provisioned IOPS SSD" is incorrect.. Provisioned IOPS SSD provides high performance but at a higher cost.

INCORRECT: Amazon EFS"" is incorrect. The Amazon Elastic File System (EFS) is not an ideal storage solution for a database.

INCORRECT: "Amazon EBS General Purpose SSD" is incorrect. AWS recommend using General Purpose SSD rather than Throughput Optimized HDD for most use cases but it is more expensive.

34. Question

A Solutions Architect is designing a solution for a financial application that will receive trading data in large volumes. What is the best solution for ingesting and processing a very large number of data streams in near real time?

1: Amazon Redshift

2: Amazon Kinesis Firehose

3: Amazon EMR

4: Amazon Kinesis Data Streams

Answer: 4

Explanation:

Kinesis Data Streams enables you to build custom applications that process or analyze streaming data for specialized needs. It enables real-time processing of streaming big data and can be used for rapidly moving data off data producers and then continuously processing the data. Kinesis Data Streams stores data for later processing by applications (key difference with Firehose which delivers data directly to AWS services).

CORRECT: "Amazon Kinesis Data Streams" is the correct answer.

INCORRECT: "Amazon Redshift" is incorrect. RedShift is a data warehouse solution used for analyzing data.

INCORRECT: "Amazon Kinesis Firehose" is incorrect. Kinesis Firehose can allow transformation of data and it then delivers data to supported services.

INCORRECT: "Amazon EMR" is incorrect. EMR is a hosted Hadoop framework that is used for analytics.

35. Question

You have created an application in a VPC that uses a Network Load Balancer (NLB). The application will be offered in a service provider model for AWS principals in other accounts within the region to consume. Based on this model, what AWS service will be used to offer the service for consumption?

1: IAM Role Based Access Control

2: Route 53

3: VPC Endpoint Services using AWS PrivateLink

4: API Gateway

Answer: 3

Explanation:

An Interface endpoint uses AWS PrivateLink and is an elastic network interface (ENI) with a private IP address that serves as an entry point for traffic destined to a supported service.

Using PrivateLink you can connect your VPC to supported AWS services, services hosted by other AWS accounts (VPC endpoint services), and supported AWS Marketplace partner services.

CORRECT: "VPC Endpoint Services using AWS PrivateLink" is the correct answer.

INCORRECT: "IAM Role Based Access Control" is incorrect as this provides authorization.

INCORRECT: "Route 53" is incorrect as this service provides DNS resolution.

INCORRECT: "API Gateway" is incorrect as this service is used for hosting REST and Websocket APIs.

36. Question

A company is migrating an on-premises 10 TB MySQL database to AWS. The company expects the database to quadruple in size and the business requirement is that replicate lag must be kept under 100 milliseconds.

Which Amazon RDS engine meets these requirements?

1: Amazon Aurora

2: Oracle

3: Microsoft SQL Server
4: MySQL

Answer: 1

Explanation:

Aurora cluster volumes automatically grow as the amount of data in your database increases. An Aurora cluster volume can grow to a maximum size of 64 tebibytes (TiB). Table size is limited to the size of the cluster volume. That is, the maximum table size for a table in an Aurora DB cluster is 64 TiB.

Aurora Replicas are independent endpoints in an Aurora DB cluster, best used for scaling read operations and increasing availability. Up to 15 Aurora Replicas can be distributed across the Availability Zones that a DB cluster spans within an AWS Region. The DB cluster volume is made up of multiple copies of the data for the DB cluster. However, the data in the cluster volume is represented as a single, logical volume to the primary instance and to Aurora Replicas in the DB cluster.

As a result, all Aurora Replicas return the same data for query results with minimal replica lag—usually much less than 100 milliseconds after the primary instance has written an update. Replica lag varies depending on the rate of database change. That is, during periods where a large amount of write operations occur for the database, you might see an increase in replica lag.

CORRECT: "Amazon Aurora" is the correct answer.

INCORRECT: "Oracle" is incorrect as this database engine does not support the size or latency requirements.

INCORRECT: "Microsoft SQL Server" is incorrect as this database engine does not support the size or latency requirements.

INCORRECT: "MySQL" is incorrect as millisecond latency is not guaranteed with this database engine.

37. Question

A Solutions Architect is determining the best method for provisioning Internet connectivity for a data-processing application that will pull large amounts of data from an object storage system via the Internet. The solution must be redundant and have no constraints on bandwidth.

Which option satisfies these requirements?

1: Deploy NAT Instances in a public subnet

2: Use a NAT Gateway

3: Create a VPC endpoint

4: Attach an Internet Gateway

Answer: 4

Explanation:

An internet gateway is a horizontally scaled, redundant, and highly available VPC component that allows communication between your VPC and the internet.

An internet gateway serves two purposes: to provide a target in your VPC route tables for internet-routable traffic, and to perform network address translation (NAT) for instances that have been assigned public IPv4 addresses.

An internet gateway supports IPv4 and IPv6 traffic. It does not cause availability risks or bandwidth constraints on your network traffic.

CORRECT: "Attach an Internet Gateway" is the correct answer.

INCORRECT: "Deploy NAT Instances in a public subnet" is incorrect. NAT instances are EC2 instances that are used, in a similar way to NAT gateways, by instances in private subnets to access the Internet. However they are not redundant and are limited in bandwidth.

INCORRECT: "Use a NAT Gateway" is incorrect as a NAT gateway does impose a limit of 45 Gbps.

INCORRECT: "Create a VPC endpoint" is incorrect. A VPC endpoint is used to access public services from a VPC without traversing the Internet.

38. Question

You need a service that can provide you with control over which traffic to allow or block to your web applications by defining customizable web security rules. You need to block common attack patterns, such as SQL injection and cross-site scripting, as well as creating custom rules for your own applications.

Which AWS service fits these requirements?

1: Security Groups

2: AWS WAF
3: CloudFront
4: Route 53

Answer: 2

Explanation:

AWS WAF is a web application firewall that helps detect and block malicious web requests targeted at your web applications. AWS WAF allows you to create rules that can help protect against common web exploits like SQL injection and cross-site scripting. With AWS WAF you first identify the resource (either an Amazon CloudFront distribution or an Application Load Balancer) that you need to protect. You then deploy the rules and filters that will best protect your applications.

The other services listed do not enable you to create custom web security rules that can block known malicious attacks.

CORRECT: "AWS WAF" is the correct answer.

INCORRECT: "Security Groups" is incorrect as explained above.

INCORRECT: "CloudFront" is incorrect as explained above.

INCORRECT: "Route 53" is incorrect as explained above.

39. Question

A Solutions Architect is designing a mobile application that will capture receipt images to track expenses. The Architect wants to store the images on Amazon S3. However, uploading the images through the web server will create too much traffic.

What is the MOST efficient method to store images from a mobile application on Amazon S3?

1: Expand the web server fleet with Spot instances to provide the resources to handle the images

2: Upload to a second bucket, and have a Lambda event copy the image to the primary bucket

3: Upload to a separate Auto Scaling Group of server behind an ELB Classic Load Balancer, and have the server instances write to the Amazon S3 bucket

4: Upload directly to S3 using a pre-signed URL

Answer: 4

Explanation:

Uploading using a pre-signed URL allows you to upload the object without having any AWS security credentials/permissions. Pre-signed URLs can be generated programmatically and anyone who receives a valid pre-signed URL can then programmatically upload an object. This solution bypasses the web server avoiding any performance bottlenecks.

CORRECT: "Upload directly to S3 using a pre-signed URL" is the correct answer.

INCORRECT: "Expand the web server fleet with Spot instances to provide the resources to handle the images" is incorrect as this is not the most efficient solution.

INCORRECT: "Upload to a second bucket, and have a Lambda event copy the image to the primary bucket" is incorrect. Uploading to a second bucket (through the web server) does not solve the issue of the web server being the bottleneck.

INCORRECT: "Upload to a separate Auto Scaling Group of server behind an ELB Classic Load Balancer, and have the server instances write to the Amazon S3 bucket" is incorrect as this is not the most efficient solution.

40. Question

An EC2 status check on an EBS volume is showing as *insufficient-data* . What is the most likely explanation?

1: The checks have failed on the volume

2: The checks may still be in progress on the volume

3: The volume does not have enough data on it to check properly

4: The checks require more information to be manually entered

Answer: 2

Explanation:

The possible values are ok, impaired, warning, or insufficient-data. If all checks pass, the overall status of the volume is ok. If the check fails, the overall status is impaired. If the status is insufficient-data, then the checks may still be taking place on your volume at the time.

CORRECT: "The checks may still be in progress on the volume" is the correct answer.

INCORRECT: "The checks have failed on the volume" is incorrect. The checks have not failed or the status would be impaired.

INCORRECT: "The volume does not have enough data on it to check properly" is incorrect. The volume does not need a certain amount of data on it to be checked properly.

INCORRECT: "The checks require more information to be manually entered" is incorrect. The checks do not require manual input.

41. Question

A Kinesis consumer application is reading at a slower rate than expected. It has been identified that multiple consumer applications have total reads exceeding the per-shard limits. How can this situation be resolved?

1: Increase the number of shards in the Kinesis data stream

2: Implement API throttling to restrict the number of requests per-shard

3: Increase the number of read transactions per shard

4: Implement read throttling for the Kinesis data stream

Answer: 1

Explanation:

One shard provides a capacity of 1MB/sec data input and 2MB/sec data output. One shard can support up to 1000 PUT records per second. The total capacity of the stream is the sum of the capacities of its shards.

In a case where multiple consumer applications have total reads exceeding the per-shard limits, you need to increase the number of shards in the Kinesis data stream.

CORRECT: "Increase the number of shards in the Kinesis data stream" is the correct answer.

INCORRECT: "Implement API throttling to restrict the number of requests per-shard" is incorrect. API throttling is used to throttle API requests it is not responsible and cannot be used for throttling Get requests in a Kinesis stream.

INCORRECT: "Increase the number of read transactions per shard" is incorrect. You cannot increase the number of read transactions per shard. Read throttling is enabled by default for Kinesis data streams. If you're still experiencing performance issues you must increase the number of shards.

INCORRECT: "Implement read throttling for the Kinesis data stream" is incorrect

42. Question

A Solutions Architect is designing a workload that requires a high performance object-based storage system that must be shared with multiple Amazon EC2 instances.

Which AWS service delivers these requirements?

1: Amazon S3

2: Amazon ElastiCache

3: Amazon EFS

4: Amazon EBS

Answer: 1

Explanation:

Amazon S3 is an object-based storage system. Though object storage systems aren't mounted and shared like filesystems or block based storage systems they can be shared by multiple instances as they allow concurrent access

CORRECT: "Amazon S3" is the correct answer.

INCORRECT: "Amazon ElastiCache" is incorrect. Amazon ElastiCache is a database caching service.

INCORRECT: "Amazon EFS" is incorrect. Amazon EFS is file-based storage system it is not object-based.

INCORRECT: "Amazon EBS" is incorrect. Amazon EBS is a block-based storage system it is not object-based.

43. Question

You have been asked to deploy a new High-Performance Computing (HPC) cluster. You need to create a design for the EC2 instances that ensures close proximity, low latency and high network throughput.

Which AWS features will help you to achieve this requirement whilst considering cost? (Select TWO)

1: Use Provisioned IOPS EBS volumes

2: Launch I/O Optimized EC2 instances in one private subnet in an AZ

3: Use EC2 instances with Enhanced Networking

4: Use dedicated hosts

5: Use Placement groups

Answer: 3,5

Explanation:

When you launch a new EC2 instance, the EC2 service attempts to place the instance in such a way that all of your instances are spread out across underlying hardware to minimize correlated failures. You can use *placement groups* to influence the placement of a group of *interdependent* instances to meet the needs of your workload. Depending on the type of workload, you can create a placement group using one of the following placement strategies:

- *Cluster* – packs instances close together inside an Availability Zone. This strategy enables workloads to achieve the low-latency network performance necessary for tightly-coupled node-to-node communication that is typical of HPC applications.
- *Partition* – spreads your instances across logical partitions such that groups of instances in one partition do not share the underlying hardware with groups of instances in different partitions. This strategy is typically used by large distributed and replicated workloads, such as Hadoop, Cassandra, and Kafka.
- *Spread* – strictly places a small group of instances across distinct underlying hardware to reduce correlated failures.

Cluster placement groups are recommended for applications that benefit from low network latency, high network throughput, or both. They are also recommended when the majority of the network traffic is between the instances in the group. To provide the lowest latency and the highest packet-per-second network performance for your placement group, choose an instance type that supports **enhanced networking** .

CORRECT: "Use EC2 instances with Enhanced Networking" is the correct answer.

CORRECT: "Use Placement groups" is the correct answer.
INCORRECT: "Use Provisioned IOPS EBS volumes" is incorrect
INCORRECT: "Launch I/O Optimized EC2 instances in one private subnet in an AZ" is incorrect. I/O optimized instances and provisioned IOPS EBS volumes are more geared towards storage performance than network performance.
INCORRECT: "Use dedicated hosts" is incorrect. Dedicated hosts might ensure close proximity of instances but would not be cost efficient.

44. Question

An issue has been reported whereby Amazon EC2 instances are not being terminated from an Auto Scaling Group behind an ELB when traffic volumes are low. How can this be fixed?

1: Modify the upper threshold settings on the ASG
2: Modify the lower threshold settings on the ASG
3: Modify the scale down increment
4: Modify the scaling settings on the ELB

Answer: 2

Explanation:

The lower threshold may be set too high. With the lower threshold if the metric falls below this number for the breach duration, a scaling operation is triggered. If it's set too high you may find that your Auto Scaling group does not scale-in when required.
CORRECT: "Modify the lower threshold settings on the ASG" is the correct answer.
INCORRECT: "Modify the upper threshold settings on the ASG" is incorrect. The upper threshold is the metric that, if the metric exceeds this number for the breach duration, a scaling operation is triggered. This would be adjusted when you need to change the behaviour of scale-out events.
INCORRECT: "Modify the scale down increment" is incorrect. The scale down increment defines the number of EC2 instances to remove when performing a scaling activity. This changes the number of instances that are removed but does not change the conditions in which they are removed which is the problem we need to solve here.

INCORRECT: "Modify the scaling settings on the ELB" is incorrect. You do not change scaling settings on an ELB, you change them on the Auto Scaling group.

45. Question

Your Business Intelligence team use SQL tools to analyze data. What would be the best solution for performing queries on structured data that is being received at a high velocity?

1: EMR using Hive
2: Kinesis Firehose with RDS
3: EMR running Apache Spark
4: Kinesis Firehose with RedShift

Answer: 4

Explanation:

Kinesis Data Firehose is the easiest way to load streaming data into data stores and analytics tools. Firehose Destinations include: Amazon S3, Amazon Redshift, Amazon Elasticsearch Service, and Splunk.

Amazon Redshift is a fast, fully managed data warehouse that makes it simple and cost-effective to analyze all your data using standard SQL and existing Business Intelligence (BI) tools.

RDS is a transactional database and is not a supported Kinesis Firehose destination.

CORRECT: "Kinesis Firehose with RedShift" is the correct answer.

INCORRECT: "EMR using Hive" is incorrect. EMR is a hosted Hadoop framework and doesn't natively support SQL.

INCORRECT: "Kinesis Firehose with RDS" is incorrect as RedShift is a better solution for an analytics use case.

INCORRECT: "EMR running Apache Spark" is incorrect. EMR is a hosted Hadoop framework and doesn't natively support SQL.

46. Question

A new security mandate requires that all personnel data held in the cloud is encrypted at rest. Which two methods allow you to encrypt data stored in S3 buckets at rest cost-efficiently? (Select TWO)

1: Make use of AWS S3 bucket policies to control access to the data at rest
2: Use AWS S3 server-side encryption with Key Management Service keys or Customer-provided keys
3: Use CloudHSM
4: Encrypt the data at the source using the client's CMK keys before transferring it to S3
5: Use Multipart upload with SSL

Answer: 2,4

Explanation:

When using S3 encryption your data is always encrypted at rest and you can choose to use KMS managed keys or customer-provided keys. If you encrypt the data at the source and transfer it in an encrypted state it will also be encrypted in-transit.

With client side encryption data is encrypted on the client side and transferred in an encrypted state and with server-side encryption data is encrypted by S3 before it is written to disk (data is decrypted when it is downloaded).

CORRECT: "Use AWS S3 server-side encryption with Key Management Service keys or Customer-provided keys" is the correct answer.

CORRECT: "Encrypt the data at the source using the client's CMK keys before transferring it to S3" is the correct answer.

INCORRECT: "Make use of AWS S3 bucket policies to control access to the data at rest" is incorrect. You can use bucket policies to control encryption of data that is uploaded but use of encryption is not stated in the answer given. Simply using bucket policies to control access to the data does not meet the security mandate that data must be encrypted.

INCORRECT: "Use CloudHSM" is incorrect. CloudHSM can be used to encrypt data but as a dedicated service it is charged on an hourly basis and is less cost-efficient compared to S3 encryption or encrypting the data at the source.

INCORRECT: "Use Multipart upload with SSL" is incorrect. Multipart upload helps with uploading large files but does not encrypt your data.

47. Question

An application stack includes an Elastic Load Balancer in a public subnet, a fleet of Amazon EC2 instances in an Auto Scaling Group, and an Amazon RDS MySQL cluster. Users connect to the application from the Internet. The application servers and database must be secure.

What is the most appropriate architecture for the application stack?

1: Create a public subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster

2: Create a public subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster

3: Create a private subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster

4: Create a private subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster

Answer: 3

Explanation:

Typically, the nodes of an Internet-facing load balancer have public IP addresses and must therefore be in a public subnet. To keep your back-end instances secure you can place them in a private subnet. To do this you must associate a corresponding public and private subnet for each availability zone the ELB/instances are in).

For RDS, you create a DB subnet group which is a collection of subnets (typically private) that you create in a VPC and that you then designate for your DB instances.

CORRECT: "Create a private subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster" is the correct answer.

INCORRECT: "Create a public subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster" is incorrect as both tiers should be in private subnets.

INCORRECT: "Create a public subnet for the Amazon EC2 instances and a private subnet for the Amazon RDS cluster" is incorrect as both tiers should be in private subnets.

INCORRECT: "Create a private subnet for the Amazon EC2 instances and a public subnet for the Amazon RDS cluster" is incorrect as both tiers should be in private subnets.

48. Question

An application currently stores all data on Amazon EBS volumes. All EBS volumes must be backed up durably across multiple Availability Zones.

What is the MOST resilient way to back up volumes?

1: Take regular EBS snapshots

2: Enable EBS volume encryption

3: Mirror data across two EBS volumes

4: Create a script to copy data to an EC2 instance store

Answer: 1

Explanation:

You can back up the data on your Amazon EBS volumes to Amazon S3 by taking point-in-time snapshots. Snapshots are *incremental* backups, which means that only the blocks on the device that have changed after your most recent snapshot are saved. This minimizes the time required to create the snapshot and saves on storage costs by not duplicating data. When you delete a snapshot, only the data unique to that snapshot is removed. Each snapshot contains all of the information that is needed to restore your data (from the moment when the snapshot was taken) to a new EBS volume.

CORRECT: "Take regular EBS snapshots" is the correct answer.

INCORRECT: "Enable EBS volume encryption" is incorrect. Enabling volume encryption would not increase resiliency.

INCORRECT: "Mirror data across two EBS volumes" is incorrect. Mirroring data would provide resilience however both volumes would need to be mounted to the EC2 instance within the same AZ so you are not getting the redundancy required.

INCORRECT: "Create a script to copy data to an EC2 instance store" is incorrect. Instance stores are ephemeral (non-persistent) data stores so would not add any resilience.

49. Question

You have implemented API Gateway and enabled a cache for a specific stage. How can you control the cache to enhance performance and reduce load on back-end services?

1: Configure the throttling feature
2: Enable bursting
3: Using time-to-live (TTL) settings
4: Using CloudFront controls

Answer: 3

Explanation:

You can enable API caching in Amazon API Gateway to cache your endpoint's responses. With caching, you can reduce the number of calls made to your endpoint and also improve the latency of requests to your API.

When you enable caching for a stage, API Gateway caches responses from your endpoint for a specified time-to-live (TTL) period, in seconds. API Gateway then responds to the request by looking up the endpoint response from the cache instead of making a request to your endpoint. The default TTL value for API caching is 300 seconds. The maximum TTL value is 3600 seconds. TTL=0 means caching is disabled.

CORRECT: "Using time-to-live (TTL) settings" is the correct answer.

INCORRECT: "Configure the throttling feature" is incorrect. You can throttle and monitor requests to protect your back-end, but the cache is used to reduce the load on the back-end.

INCORRECT: "Enable bursting" is incorrect. Bursting isn't an API Gateway feature that you can enable or disable.

INCORRECT: "Using CloudFront controls" is incorrect. CloudFront is a bogus answer as even though it does have a cache of its own it won't help you to enhance the performance of the API Gateway cache.

50. Question

The development team at your company have created a new mobile application that will be used by users to access confidential data. The developers have used Amazon Cognito for authentication, authorization, and user management. Due to the sensitivity of the data, there is a requirement to add another method of authentication in addition to a username and password.

You have been asked to recommend the best solution. What is your recommendation?

1: Use multi-factor authentication (MFA) with a Cognito user pool

2: Integrate a third-party identity provider (IdP)
3: Enable multi-factor authentication (MFA) in IAM
4: Integrate IAM with a user pool in Cognito

Answer: 1

Explanation:

You can use MFA with a Cognito user pool (not in IAM) and this satisfies the requirement.

A user pool is a user directory in Amazon Cognito. With a user pool, your users can sign in to your web or mobile app through Amazon Cognito. Your users can also sign in through social identity providers like Facebook or Amazon, and through SAML identity providers.

CORRECT: "Use multi-factor authentication (MFA) with a Cognito user pool" is the correct answer.

INCORRECT: "Integrate a third-party identity provider (IdP)" is incorrect is not the best solution as a Cognito user pool can satisfy the requirements along with MFA.

INCORRECT: "Enable multi-factor authentication (MFA) in IAM" is incorrect as a Cognito user pool should be used for this use case.

INCORRECT: "Integrate IAM with a user pool in Cognito" is incorrect. Integrating IAM with a Cognito user pool or integrating a 3rd party IdP does not add another factor of authentication – "factors" include something you know (e.g. password), something you have (e.g. token device), and something you are (e.g. retina scan or fingerprint).

51. Question

A company is serving videos to their customers from us-east-1 from an Amazon S3 bucket. The company's customers are located around the world and there is high demand during peak hours. Customers in Asia complain about slow download speeds during peak hours and customers in all locations have reported experiencing HTTP 500 errors.

How can a Solutions Architect address the issues?

1: Use an Amazon Route 53 weighted routing policy for the CloudFront domain name to distribute GET requests between CloudFront and the S3 bucket

2: Replicate the bucket in us-east-1 and use Amazon Route 53 failover routing to determine which bucket to serve the content from

3: Cache the web content using Amazon CloudFront and use all Edge locations for content delivery

4: Place an Amazon ElastiCache cluster in front of the S3 bucket

Answer: 3

Explanation:

The most straightforward solution is to use CloudFront to cache the content in the Edge locations around the world that are close to users. This is easy to implement and will solve the issues reported.

CloudFront has many edge locations around the world for caching the content.

CORRECT: "Cache the web content using Amazon CloudFront and use all Edge locations for content delivery" is the correct answer.

INCORRECT: "Use an Amazon Route 53 weighted routing policy for the CloudFront domain name to distribute GET requests between CloudFront and the S3 bucket" is incorrect. Route 53 weighted policies are used to direct traffic proportionally to different sites not based on latency or geography.

INCORRECT: "Replicate the bucket in us-east-1 and use Amazon Route 53 failover routing to determine which bucket to serve the content from" is incorrect. You could replicate the data in the buckets and use latency based routing to direct clients to the closest bucket but this option isn't presented. Failover routing is used for high availability and would not assist here.

INCORRECT: "Place an Amazon ElastiCache cluster in front of the S3 bucket" is incorrect. ElastiCache is a database caching service, it does not cache content from S3 buckets.

52. Question

There is expected to be a large increase in write intensive traffic to a website you manage that registers users onto an online learning program. You are concerned about writes to the database being dropped and need to come up with a solution to ensure this does not happen. Which of the solution options below would be the best approach to take?

1: Update the application to write data to an SQS queue and provision additional EC2 instances to process the data and write it to the database

2: Use RDS in a multi-AZ configuration to distribute writes across AZs
3: Use CloudFront to cache the writes and configure the database as a custom origin
4: Update the application to write data to an S3 bucket and provision additional EC2 instances to process the data and write it to the database

Answer: 1

Explanation:

This is a great use case for Amazon Simple Queue Service (Amazon SQS). SQS is a web service that gives you access to message queues that store messages waiting to be processed and offers a reliable, highly-scalable, hosted queue for storing messages in transit between computers. SQS is used for distributed/decoupled applications. In this circumstance SQS will reduce the risk of writes being dropped and it the best option presented.

CORRECT: "Update the application to write data to an SQS queue and provision additional EC2 instances to process the data and write it to the database" is the correct answer.

INCORRECT: "Use RDS in a multi-AZ configuration to distribute writes across AZs" is incorrect. RDS in a multi-AZ configuration will not help as writes are only made to the primary database.

INCORRECT: "Use CloudFront to cache the writes and configure the database as a custom origin" is incorrect. You cannot configure a database as a custom origin in CloudFront.

INCORRECT: "Update the application to write data to an S3 bucket and provision additional EC2 instances to process the data and write it to the database" is incorrect. Though writing data to an S3 bucket could potentially work, it is not the best option as SQS is recommended for decoupling application components.

53. Question

You are designing a solution on AWS that requires a file storage layer that can be shared between multiple EC2 instances. The storage should be highly-available and should scale easily.

Which AWS service can be used for this design?

1: Amazon S3
2: Amazon EC2 instance store

3: Amazon EFS
4: Amazon EBS

Answer: 3

Explanation:

Amazon EFS provides file storage in the AWS Cloud. With Amazon EFS, you can create a file system, mount the file system on an Amazon EC2 instance, and then read and write data to and from your file system.

You can mount an Amazon EFS file system in your VPC, through the Network File System versions 4.0 and 4.1 (NFSv4) protocol. We recommend using a current generation Linux NFSv4.1 client, such as those found in the latest Amazon Linux, Redhat, and Ubuntu AMIs, in conjunction with the Amazon EFS Mount Helper.

CORRECT: "Amazon EFS" is the correct answer.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 is an object storage system that is accessed via REST API not file-level protocols. It cannot be attached to EC2 instances.

INCORRECT: "Amazon EC2 instance store" is incorrect. An EC2 instance store is an ephemeral storage volume that is local to the server on which the instances runs and is not persistent. It is accessed via block protocols and also cannot be shared between instances.

INCORRECT: "Amazon EBS" is incorrect. An Amazon Elastic Block Store (EBS) volume can only be attached to a single instance and cannot be shared.

54. Question

A company is generating large datasets with millions of rows that must be summarized by column. Existing business intelligence tools will be used to build daily reports.

Which storage service meets the requirements?

1: Amazon DynamoDB
2: Amazon RDS
3: Amazon RedShift
4: Amazon ElastiCache

Answer: 3

Explanation:

Amazon Redshift is a fast, fully managed, petabyte-scale data warehouse service that makes it simple and cost-effective to efficiently analyze all your data using your existing business intelligence tools. It is optimized for datasets ranging from a few hundred gigabytes to a petabyte or more. Amazon RedShift uses columnar storage.

CORRECT: "Amazon RedShift" is the correct answer.

INCORRECT: "Amazon DynamoDB" is incorrect. Amazon DynamoDB is a fully managed NoSQL database service, it is not a columnar database.

INCORRECT: "Amazon RDS" is incorrect. Amazon RDS is more suited to OLTP workloads rather than analytics workloads.

INCORRECT: "Amazon ElastiCache" is incorrect. Amazon ElastiCache is an in-memory caching service.

55. Question

You need to scale read operations for your Amazon Aurora DB within a region. To increase availability you also need to be able to failover if the primary instance fails.

What should you implement?

1: Aurora Replicas

2: A DB cluster

3: An Aurora Cluster Volume

4: Aurora Global Database

Answer: 1

Explanation:

Aurora Replicas are independent endpoints in an Aurora DB cluster, best used for scaling read operations and increasing availability. Up to 15 Aurora Replicas can be distributed across the Availability Zones that a DB cluster spans within an AWS Region. To increase availability, you can use Aurora Replicas as failover targets. That is, if the primary instance fails, an Aurora Replica is promoted to the primary instance.

CORRECT: "Aurora Replicas" is the correct answer.

INCORRECT: "A DB cluster" is incorrect. An **Amazon Aurora DB cluster** consists of a DB instance, compatible with either MySQL or PostgreSQL, and a cluster volume that represents the data for the DB cluster, copied across three Availability Zones as a single, virtual volume. The DB cluster contains a primary instance and, ***optionally*** , up to 15 Aurora Replicas. A DB cluster does not necessarily scale read operations as it is option to deploy Aurora Replicas, therefore it can be thought of as more of a storage level availability feature in this case and is not the best answer.

INCORRECT: "An Aurora Cluster Volume" is incorrect. A cluster volume manages the data for DB instances in a DB cluster and does not provide read scaling.

INCORRECT: "Aurora Global Database" is incorrect. Amazon Aurora Global Database is not suitable for scaling read operations within a region. It is a new feature in the MySQL-compatible edition of Amazon Aurora, designed for applications with a global footprint. It allows a single Aurora database to span multiple AWS regions, with fast replication to enable low-latency global reads and disaster recovery from region-wide outages.

56. Question

An Architect is designing a serverless application that will accept images uploaded by users from around the world. The application will make API calls to back-end services and save the session state data of the user to a database.

Which combination of services would provide a solution that is cost-effective while delivering the least latency?

1: Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, DynamoDB

2: Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, Amazon RDS

3: Amazon S3, API Gateway, AWS Lambda, Amazon RDS

4: API Gateway, Amazon S3, AWS Lambda, DynamoDB

Answer: 1

Explanation:

Amazon CloudFront caches content closer to users at Edge locations around the world. This is the lowest latency option for uploading content. API

Gateway and AWS Lambda are present in all options. DynamoDB can be used for storing session state data. This is a 100% serverless application.

CORRECT: "Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, DynamoDB" is the correct answer.

INCORRECT: "Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, Amazon RDS" is incorrect. Amazon RDS is not a serverless service so this option can be ruled out.

INCORRECT: "Amazon S3, API Gateway, AWS Lambda, Amazon RDS" is incorrect. Amazon S3 alone will not provide the least latency for users around the world unless you have many buckets in different regions and a way of directing users to the closest bucket (such as Route 3 latency based routing). However, you would then need to manage replicating the data.

INCORRECT: "API Gateway, Amazon S3, AWS Lambda, DynamoDB" is incorrect. This answer does not offer a front-end for users to upload content to.

57. Question

You are developing an application that uses Lambda functions. You need to store some sensitive data that includes credentials for accessing the database tier. You are planning to store this data as environment variables within Lambda. How can you ensure this sensitive information is properly secured?

1: This cannot be done, only the environment variables that relate to the Lambda function itself can be encrypted

2: Use encryption helpers that leverage AWS Key Management Service to store the sensitive information as Ciphertext

3: There is no need to make any changes as all environment variables are encrypted by default with AWS Lambda

4: Store the environment variables in an encrypted DynamoDB table and configure Lambda to retrieve them as required

Answer: 2

Explanation:

Environment variables for Lambda functions enable you to dynamically pass settings to your function code and libraries, without making changes to your code. Environment variables are key-value pairs that you create and modify

as part of your function configuration, using either the AWS Lambda Console, the AWS Lambda CLI or the AWS Lambda SDK. You can use environment variables to help libraries know what directory to install files in, where to store outputs, store connection and logging settings, and more.

CORRECT: "Use encryption helpers that leverage AWS Key Management Service to store the sensitive information as Ciphertext" is the correct answer.

INCORRECT: "This cannot be done, only the environment variables that relate to the Lambda function itself can be encrypted" is incorrect as there is a solution to this requirement.

INCORRECT: "There is no need to make any changes as all environment variables are encrypted by default with AWS Lambda" is incorrect. When you deploy your Lambda function, all the environment variables you've specified are encrypted by default after, but not during, the deployment process. They are then decrypted automatically by AWS Lambda when the function is invoked. If you need to store sensitive information in an environment variable, you should encrypt that information before deploying your Lambda function. The Lambda console makes that easier for you by providing encryption helpers that leverage AWS Key Management Service to store that sensitive information as Ciphertext.

INCORRECT: "Store the environment variables in an encrypted DynamoDB table and configure Lambda to retrieve them as required" is incorrect. The environment variables are not encrypted throughout the entire process so there is a need to take action here. Storing the variables in an encrypted DynamoDB table is not necessary when you can use encryption helpers.

58. Question

You are deploying an application on Amazon EC2 that must call AWS APIs. Which method of securely passing credentials to the application should you use?

1: Store the API credentials on the instance using instance metadata

2: Store API credentials as an object in Amazon S3

3: Embed the API credentials into your application files

4: Assign IAM roles to the EC2 instances

Answer: 4

Explanation:

Applications must sign their API requests with AWS credentials. Therefore, if you are an application developer, you need a strategy for managing credentials for your applications that run on EC2 instances. For example, you can securely distribute your AWS credentials to the instances, enabling the applications on those instances to use your credentials to sign requests, while protecting your credentials from other users.

However, it's challenging to securely distribute credentials to each instance, especially those that AWS creates on your behalf, such as Spot Instances or instances in Auto Scaling groups. You must also be able to update the credentials on each instance when you rotate your AWS credentials.

IAM roles enable your applications to securely make API requests from your instances, without requiring you to manage the security credentials that the applications use. Instead of creating and distributing your AWS credentials, you can delegate permission to make API requests using IAM roles.

CORRECT: "Assign IAM roles to the EC2 instances" is the correct answer.

INCORRECT: "Store the API credentials on the instance using instance metadata" is incorrect. It is an AWS best practice not to store API credentials within applications, on file systems or on instances (such as in metadata).

INCORRECT: "Store API credentials as an object in Amazon S3" is incorrect. It is an AWS best practice not to store API credentials within applications, on file systems or on instances (such as in metadata).

INCORRECT: "Embed the API credentials into your application files" is incorrect. It is an AWS best practice not to store API credentials within applications, on file systems or on instances (such as in metadata).

59. Question

A Solutions Architect needs to monitor application logs and receive a notification whenever a specific number of occurrences of certain HTTP status code errors occur. Which tool should the Architect use?

1: CloudWatch Metrics

2: CloudWatch Events

3: CloudTrail Trails

4: CloudWatch Logs

Answer: 4

Explanation:

You can use CloudWatch Logs to monitor applications and systems using log data. For example, CloudWatch Logs can track the number of errors that occur in your application logs and send you a notification whenever the rate of errors exceeds a threshold you specify. This is the best tool for this requirement.

CORRECT: "CloudWatch Logs" is the correct answer.

INCORRECT: "CloudWatch Metrics" is incorrect. CloudWatch Metrics are the fundamental concept in CloudWatch. A metric represents a time-ordered set of data points that are published to CloudWatch. You cannot use a metric alone, it is used when setting up monitoring for any service in CloudWatch.

INCORRECT: "CloudWatch Events" is incorrect. Amazon CloudWatch Events delivers a near real-time stream of system events that describe changes in Amazon Web Services (AWS) resources. Though you can generate custom application-level events and publish them to CloudWatch Events this is not the best tool for monitoring application logs.

INCORRECT: "CloudTrail Trails" is incorrect. CloudTrail is used for monitoring API activity on your account, not for monitoring application logs.

60. Question

A Solutions Architect is designing a static website that will use the zone apex of a DNS domain (e.g. example.com). The Architect wants to use the Amazon Route 53 service. Which steps should the Architect take to implement a scalable and cost-effective solution? (Select TWO)

1: Create a Route 53 hosted zone, and set the NS records of the domain to use Route 53 name servers

2: Serve the website from an Amazon S3 bucket, and map a Route 53 Alias record to the website endpoint

3: Host the website on an Amazon EC2 instance, and map a Route 53 Alias record to the public IP address of the EC2 instance

4: Host the website using AWS Elastic Beanstalk, and map a Route 53 Alias record to the Beanstalk stack

5: Host the website on an Amazon EC2 instance with ELB and Auto Scaling, and map a Route 53 Alias record to the ELB endpoint

Answer: 1,2

Explanation:

To use Route 53 for an existing domain the Architect needs to change the NS records to point to the Amazon Route 53 name servers. This will direct name resolution to Route 53 for the domain name. The most cost-effective solution for hosting the website will be to use an Amazon S3 bucket. To do this you create a bucket using the same name as the domain name (e.g. example.com) and use a Route 53 Alias record to map to it.

CORRECT: "Create a Route 53 hosted zone, and set the NS records of the domain to use Route 53 name servers" is the correct answer.

CORRECT: "Serve the website from an Amazon S3 bucket, and map a Route 53 Alias record to the website endpoint" is the correct answer.

INCORRECT: "Host the website on an Amazon EC2 instance, and map a Route 53 Alias record to the public IP address of the EC2 instance" is incorrect.Using an EC2 instance instead of an S3 bucket would be more costly.

INCORRECT: "Host the website using AWS Elastic Beanstalk, and map a Route 53 Alias record to the Beanstalk stack" is incorrect. Elastic Beanstalk provisions EC2 instances so again this would be a more costly option.

INCORRECT: "Host the website on an Amazon EC2 instance with ELB and Auto Scaling, and map a Route 53 Alias record to the ELB endpoint" is incorrect. Using an EC2 instance instead of an S3 bucket would be more costly.

61. Question

A Solutions Architect is designing a web page for event registrations and needs a managed service to send a text message to users every time users sign up for an event.

Which AWS service should the Architect use to achieve this?

1: Amazon STS

2: Amazon SQS

3: AWS Lambda

4: Amazon SNS

Answer: 4

Explanation:

Amazon Simple Notification Service (SNS) is a web service that makes it easy to set up, operate, and send notifications from the cloud and supports notifications over multiple transports including HTTP/HTTPS, Email/Email-JSON, SQS and SMS.

CORRECT: "Amazon SNS" is the correct answer.

INCORRECT: "Amazon STS" is incorrect. Amazon Security Token Service (STS) is used for requesting temporary credentials.

INCORRECT: "Amazon SQS" is incorrect. Amazon Simple Queue Service (SQS) is a message queue used for decoupling application components.

INCORRECT: "AWS Lambda" is incorrect. Lambda is a serverless service that runs code in response to events/triggers.

62. Question

A company runs a service on AWS to provide offsite backups for images on laptops and phones. The solution must support millions of customers, with thousands of images per customer. Images will be retrieved infrequently but must be available for retrieval immediately.

Which is the MOST cost-effective storage option that meets these requirements?

1: Amazon Glacier with expedited retrievals

2: Amazon S3 Standard-Infrequent Access

3: Amazon EFS

4: Amazon S3 Standard

Answer: 2

Explanation:

S3 Standard-IA is for data that is accessed less frequently, but requires rapid access when needed. S3 Standard-IA offers the high durability, high throughput, and low latency of S3 Standard, with a low per GB storage price and per GB retrieval fee.

This combination of low cost and high performance make S3 Standard-IA ideal for long-term storage, backups, and as a data store for disaster recovery

files. S3 Storage Classes can be configured at the object level and a single bucket can contain objects stored across S3 Standard, S3 Intelligent-Tiering, S3 Standard-IA, and S3 One Zone-IA.

You can also use S3 Lifecycle policies to automatically transition objects between storage classes without any application changes.

Amazon S3 Standard-Infrequent Access is the most cost-effective choice.

CORRECT: "Amazon S3 Standard-Infrequent Access" is the correct answer.

INCORRECT: "Amazon Glacier with expedited retrievals" is incorrect. Amazon Glacier with expedited retrievals is fast (1-5 minutes) but not immediate.

INCORRECT: "Amazon EFS" is incorrect. Amazon EFS is a high-performance file system and not ideally suited to this scenario, it is also not the most cost-effective option.

INCORRECT: "Amazon S3 Standard" is incorrect. Amazon S3 Standard provides immediate retrieval but is not less cost-effective compared to Standard-Infrequent access.

63. Question

A Solutions Architect is designing a solution to store and archive corporate documents, and has determined that Amazon Glacier is the right solution. Data must be delivered within 10 minutes of a retrieval request.

Which features in Amazon Glacier can help meet this requirement?

1: Standard retrieval

2: Bulk retrieval

3: Expedited retrieval

4: Vault Lock

Answer: 3

Explanation:

You can specify one of the following when initiating a job to retrieve an archive based on your access time and cost requirements.

- **Expedited —** Expedited retrievals allow you to quickly access your data when occasional urgent requests for a subset of archives are

required. For all but the largest archives (250 MB+), data accessed using Expedited retrievals are typically made available within 1–5 minutes. Provisioned Capacity ensures that retrieval capacity for Expedited retrievals is available when you need it.

- **Standard —** Standard retrievals allow you to access any of your archives within several hours. Standard retrievals typically complete within 3–5 hours. This is the default option for retrieval requests that do not specify the retrieval option.
- **Bulk —** Bulk retrievals are S3 Glacier's lowest-cost retrieval option, which you can use to retrieve large amounts, even petabytes, of data inexpensively in a day. Bulk retrievals typically complete within 5–12 hours.

CORRECT: "Expedited retrieval" is the correct answer.

INCORRECT: "Standard retrieval" is incorrect. Standard retrievals typically complete in 3-5 hours.

INCORRECT: "Bulk retrieval" is incorrect. Bulk retrievals allow cost-effective access to significant amounts of data in 5-12 hours.

INCORRECT: "Vault Lock" is incorrect. Vault Lock allows you to easily deploy and enforce compliance controls on individual Glacier vaults via a lockable policy (Vault Lock policy).

64. Question

You are planning to deploy a number of EC2 instances in your VPC. The EC2 instances will be deployed across several subnets and multiple AZs. What AWS feature can act as an instance-level firewall to control traffic between your EC2 instances?

1: AWS WAF

2: Security group

3: Route table

4: Network ACL

Answer: 2

Explanation:

A *security group* acts as a virtual firewall for your instance to control inbound and outbound traffic. When you launch an instance in a VPC, you can assign up to five security groups to the instance. Security groups act at

the instance level, not the subnet level. Therefore, each instance in a subnet in your VPC can be assigned to a different set of security groups.

CORRECT: "Security group" is the correct answer.

INCORRECT: "AWS WAF" is incorrect. AWS WAF is a web application firewall and does not work at the instance level.

INCORRECT: "Route table" is incorrect. Route tables are not firewalls.

INCORRECT: "Network ACL" is incorrect. Network ACL's function at the subnet level.

65. Question

A critical database runs in your VPC for which availability is a concern. Which RDS DB instance events may force the DB to be taken offline during a maintenance window?

1: Selecting the Multi-AZ feature

2: Security patching

3: Promoting a Read Replica

4: Updating DB parameter groups

Answer: 2

Explanation:

Periodically, Amazon RDS performs maintenance on Amazon RDS resources. Maintenance most often involves updates to the DB instance's underlying hardware, underlying operating system (OS), or database engine version. Updates to the operating system most often occur for security issues and should be done as soon as possible.

Some maintenance items require that Amazon RDS take your DB instance offline for a short time. Maintenance items that require a resource to be offline include required operating system or database patching. Required patching is automatically scheduled only for patches that are related to security and instance reliability. Such patching occurs infrequently (typically once every few months) and seldom requires more than a fraction of your maintenance window.

Enabling Multi-AZ, promoting a Read Replica and updating DB parameter groups are not events that take place during a maintenance window.

CORRECT: "Security patching" is the correct answer.

INCORRECT: "Selecting the Multi-AZ feature" is incorrect as explained above.

INCORRECT: "Promoting a Read Replica" is incorrect as explained above.

INCORRECT: "Updating DB parameter groups" is incorrect as explained above.

SET 4: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 4: Practice Questions, Answers & Explanations

1. Question

A company is deploying an Amazon ElastiCache for Redis cluster. To enhance security a password should be required to access the database. What should the solutions architect use?

1: AWS Directory Service

2: AWS IAM Policy

3: Redis AUTH command

4: VPC Security Group

2. Question

To increase performance and redundancy for an application a company has decided to run multiple implementations in different AWS Regions behind network load balancers. The company currently advertise the application using two public IP addresses from separate /24 address ranges and would prefer not to change these. Users should be directed to the closest available application endpoint.

Which actions should a solutions architect take? (Select TWO)

1: Create an Amazon Route 53 geolocation based routing policy

2: Create an AWS Global Accelerator and attach endpoints in each AWS Region

3: Assign new static anycast IP addresses and modify any existing pointers

4: Migrate both public IP addresses to the AWS Global Accelerator

5: Create PTR records to map existing public IP addresses to an Alias

3. Question

Three Amazon VPCs are used by a company in the same region. The company has two AWS Direct Connect connections to two separate company offices and wishes to share these with all three VPCs. A

Solutions Architect has created an AWS Direct Connect gateway. How can the required connectivity be configured?

1: Associate the Direct Connect gateway to a transit gateway

2: Associate the Direct Connect gateway to a virtual private gateway in each VPC

3: Create a VPC peering connection between the VPCs and route entries for the Direct Connect Gateway

4: Create a transit virtual interface between the Direct Connect gateway and each VPC

4. Question

A retail organization sends coupons out twice a week and this results in a predictable surge in sales traffic. The application runs on Amazon EC2 instances behind an Elastic Load Balancer. The organization is looking for ways to reduce cost without impacting performance or reliability. How can they achieve this goal?

1: Purchase scheduled reserved instances

2: Use a mixture of spot instances and on demand instances

3: Increase the instance size of the existing EC2 instances

4: Purchase Amazon EC2 dedicated hosts

5. Question

Over 500 TB of data must be analyzed using standard SQL business intelligence tools. The dataset consists of a combination of structured data and unstructured data. The unstructured data is small and stored on Amazon S3. Which AWS services are most suitable for performing analytics on the data?

1: Amazon RDS MariaDB with Amazon Athena

2: Amazon DynamoDB with Amazon DynamoDB Accelerator (DAX)

3: Amazon ElastiCache for Redis with cluster mode enabled

4: Amazon Redshift with Amazon Redshift Spectrum

6. Question

An application is being monitored using Amazon GuardDuty. A Solutions Architect needs to be notified by email of medium to high

severity events. How can this be achieved?

1: Configure an Amazon CloudWatch alarm that triggers based on a GuardDuty metric

2: Create an Amazon CloudWatch events rule that triggers an Amazon SNS topic

3: Create an Amazon CloudWatch Logs rule that triggers an AWS Lambda function

4: Configure an Amazon CloudTrail alarm the triggers based on GuardDuty API activity

7. Question

A company is migrating a decoupled application to AWS. The application uses a message broker based on the MQTT protocol. The application will be migrated to Amazon EC2 instances and the solution for the message broker must not require rewriting application code.

Which AWS service can be used for the migrated message broker?

1: Amazon SQS

2: Amazon SNS

3: Amazon MQ

4: AWS Step Functions

8. Question

A HR application stores employment records on Amazon S3. Regulations mandate the records are retained for seven years. Once created the records are accessed infrequently for the first three months and then must be available within 10 minutes if required thereafter.

Which lifecycle action meets the requirements whilst MINIMIZING cost?

1: Store the data in S3 Standard for 3 months, then transition to S3 Glacier

2: Store the data in S3 Standard-IA for 3 months, then transition to S3 Glacier

3: Store the data in S3 Standard for 3 months, then transition to S3 Standard-IA

4: Store the data in S3 Intelligent Tiering for 3 months, then transition to S3 Standard-IA

9. Question

A highly elastic application consists of three tiers. The application tier runs in an Auto Scaling group and processes data and writes it to an Amazon RDS MySQL database. The Solutions Architect wants to restrict access to the database tier to only accept traffic from the instances in the application tier. However, instances in the application tier are being constantly launched and terminated.

How can the Solutions Architect configure secure access to the database tier?

1: Configure the database security group to allow traffic only from the application security group

2: Configure the database security group to allow traffic only from port 3306

3: Configure a Network ACL on the database subnet to deny all traffic to ports other than 3306

4: Configure a Network ACL on the database subnet to allow all traffic from the application subnet

10. Question

A Solutions Architect is rearchitecting an application with decoupling. The application will send batches of up to 1000 messages per second that must be received in the correct order by the consumers.

Which action should the Solutions Architect take?

1: Create an Amazon SQS Standard queue

2: Create an Amazon SNS topic

3: Create an Amazon SQS FIFO queue

4: Create an AWS Step Functions state machine

11. Question

A Solutions Architect is designing an application that consists of AWS Lambda and Amazon RDS Aurora MySQL. The Lambda function must use database credentials to authenticate to MySQL and security policy mandates that these credentials must not be stored in the function code.

How can the Solutions Architect securely store the database credentials and make them available to the function?

1: Store the credentials in AWS Key Management Service and use environment variables in the function code pointing to KMS

2: Store the credentials in Systems Manager Parameter Store and update the function code and execution role

3: Use the AWSAuthenticationPlugin and associate an IAM user account in the MySQL database

4: Create an IAM policy and store the credentials in the policy. Attach the policy to the Lambda function execution role

12. Question

A company are finalizing their disaster recovery plan. A limited set of core services will be replicated to the DR site ready to seamlessly take over the in the event of a disaster. All other services will be switched off.

Which DR strategy is the company using?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

13. Question

An application that runs a computational fluid dynamics workload uses a tightly-coupled HPC architecture that uses the MPI protocol and runs across many nodes. A service-managed deployment is required to minimize operational overhead.

Which deployment option is MOST suitable for provisioning and managing the resources required for this use case?

1: Use Amazon EC2 Auto Scaling to deploy instances in multiple subnets

2: Use AWS CloudFormation to deploy a Cluster Placement Group on EC2

3: Use AWS Batch to deploy a multi-node parallel job

4: Use AWS Elastic Beanstalk to provision and manage the EC2 instances

14. Question

A Solutions Architect is designing an application that will run on an Amazon EC2 instance. The application must asynchronously invoke and

AWS Lambda function to analyze thousands of .CSV files. The services should be decoupled.

Which service can be used to decouple the compute services?

1: Amazon SQS

2: Amazon SNS

3: Amazon Kinesis

4: Amazon OpsWorks

15. Question

A large MongoDB database running on-premises must be migrated to Amazon DynamoDB within the next few weeks. The database is too large to migrate over the company's limited internet bandwidth so an alternative solution must be used. What should a Solutions Architect recommend?

1: Setup an AWS Direct Connect and migrate the database to Amazon DynamoDB using the AWS Database Migration Service (DMS)

2: Use the Schema Conversion Tool (SCT) to extract and load the data to an AWS Snowball Edge device. Use the AWS Database Migration Service (DMS) to migrate the data to Amazon DynamoDB

3: Enable compression on the MongoDB database and use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon DynamoDB

4: Use the AWS Database Migration Service (DMS) to extract and load the data to an AWS Snowball Edge device. Complete the migration to Amazon DynamoDB using AWS DMS in the AWS Cloud

16. Question

Every time an item in an Amazon DynamoDB table is modified a record must be retained for compliance reasons. What is the most efficient solution to recording this information?

1: Enable Amazon CloudWatch Logs. Configure an AWS Lambda function to monitor the log files and record deleted item data to an Amazon S3 bucket

2: Enable DynamoDB Streams. Configure an AWS Lambda function to poll the stream and record the modified item data to an Amazon S3 bucket

3: Enable Amazon CloudTrail. Configure an Amazon EC2 instance to monitor activity in the CloudTrail log files and record changed items in another DynamoDB table

4: Enable DynamoDB Global Tables. Enable DynamoDB streams on the multi-region table and save the output directly to an Amazon S3 bucket

17. Question

An application in a private subnet needs to query data in an Amazon DynamoDB table. Use of the DynamoDB public endpoints must be avoided. What is the most EFFICIENT and secure method of enabling access to the table?

1: Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)

2: Create a gateway VPC endpoint and add an entry to the route table

3: Create a private Amazon DynamoDB endpoint and connect to it using an AWS VPN

4: Create a software VPN between DynamoDB and the application in the private subnet

18. Question

A Solutions Architect needs to select a low-cost, short-term option for adding resilience to an AWS Direct Connect connection. What is the MOST cost-effective solution to provide a backup for the Direct Connect connection?

1: Implement a second AWS Direct Connection

2: Implement an IPSec VPN connection and use the same BGP prefix

3: Configure AWS Transit Gateway with an IPSec VPN backup

4: Configure an IPSec VPN connection over the Direct Connect link

19. Question

The disk configuration for an Amazon EC2 instance must be finalized. The instance will be running an application that requires heavy read/write IOPS. A single volume is required that is 500 GiB in size and needs to support 20,000 IOPS.

What EBS volume type should be selected?

1: EBS General Purpose SSD
2: EBS Provisioned IOPS SSD
3: EBS General Purpose SSD in a RAID 1 configuration
4: EBS Throughput Optimized HDD

20. Question

A new application you are designing will store data in an Amazon Aurora MySQL DB. You are looking for a way to enable inter-region disaster recovery capabilities with fast replication and fast failover. Which of the following options is the BEST solution?

1: Use Amazon Aurora Global Database
2: Enable Multi-AZ for the Aurora DB
3: Create an EBS backup of the Aurora volumes and use cross-region replication to copy the snapshot
4: Create a cross-region Aurora Read Replica

21. Question

A Solutions Architect regularly launches EC2 instances manually from the console and wants to streamline the process to reduce administrative overhead. Which feature of EC2 enables storing of settings such as AMI ID, instance type, key pairs and Security Groups?

1: Placement Groups
2: Launch Templates
3: Run Command
4: Launch Configurations

22. Question

You recently noticed that your Network Load Balancer (NLB) in one of your VPCs is not distributing traffic evenly between EC2 instances in your AZs. There are an odd number of EC2 instances spread across two AZs. The NLB is configured with a TCP listener on port 80 and is using active health checks.

What is the most likely problem?

1: There is no HTTP listener
2: Health checks are failing in one AZ due to latency

3: NLB can only load balance within a single AZ
4: Cross-zone load balancing is disabled

23. Question

A Solutions Architect is creating a design for a multi-tiered serverless application. Which two services form the application facing services from the AWS serverless infrastructure? (Select TWO)

1: API Gateway
2: AWS Cognito
3: AWS Lambda
4: Amazon ECS
5: Elastic Load Balancer

24. Question

A Solutions Architect attempted to restart a stopped EC2 instance and it immediately changed from a pending state to a terminated state. What are the most likely explanations? (Select TWO)

1: You've reached your EBS volume limit
2: An EBS snapshot is corrupt
3: AWS does not currently have enough available On-Demand capacity to service your request
4: You have reached the limit on the number of instances that you can launch in a region
5: The AMI is unsupported

25. Question

One of the applications you manage on RDS uses the MySQL DB and has been suffering from performance issues. You would like to setup a reporting process that will perform queries on the database but you're concerned that the extra load will further impact the performance of the DB and may lead to poor customer experience.

What would be the best course of action to take so you can implement the reporting process?

1: Configure Multi-AZ to setup a secondary database instance in another region

2: Deploy a Read Replica to setup a secondary read-only database instance
3: Deploy a Read Replica to setup a secondary read and write database instance
4: Configure Multi-AZ to setup a secondary database instance in another Availability Zone

26. Question

A Solutions Architect is building a new Amazon Elastic Container Service (ECS) cluster. The ECS instances are running the EC2 launch type and load balancing is required to distribute connections to the tasks. It is required that the mapping of ports is performed dynamically and connections are routed to different groups of servers based on the path in the URL.

Which AWS service should the Solutions Architect choose to fulfil these requirements?

1: An Amazon ECS Service
2: Application Load Balancer
3: Network Load Balancer
4: Classic Load Balancer

27. Question

A Solutions Architect needs to connect from an office location to a Linux instance that is running in a public subnet in an Amazon VPC using the Internet. Which of the following items are required to enable this access? (Select TWO)

1: A bastion host
2: A NAT Gateway
3: A Public or Elastic IP address on the EC2 instance
4: An Internet Gateway attached to the VPC and route table attached to the public subnet pointing to it
5: An IPSec VPN

28. Question

An Auto Scaling Group is unable to respond quickly enough to load changes resulting in lost messages from another application tier. The

messages are typically around 128KB in size.
What is the best design option to prevent the messages from being lost?
1: Store the messages on Amazon S3
2: Launch an Elastic Load Balancer
3: Store the messages on an SQS queue
4: Use larger EC2 instance sizes

29. Question
A Solutions Architect needs to run a production batch process quickly that will use several EC2 instances. The process cannot be interrupted and must be completed within a short time period.
What is likely to be the MOST cost-effective choice of EC2 instance type to use for this requirement?
1: Reserved instances
2: Spot instances
3: Flexible instances
4: On-demand instances

30. Question
A Solutions Architect would like to implement a method of automating the creation, retention, and deletion of backups for the Amazon EBS volumes in an Amazon VPC. What is the easiest way to automate these tasks using AWS tools?
1: Configure EBS volume replication to create a backup on Amazon S3
2: Use the EBS Data Lifecycle Manager (DLM) to manage snapshots of the volumes
3: Create a scheduled job and run the AWS CLI command “create-backup” to take backups of the EBS volumes
4: Create a scheduled job and run the AWS CLI command “create-snapshot” to take backups of the EBS volumes

31. Question
A mobile app uploads usage information to a database. Amazon Cognito is being used for authentication, authorization and user management and users sign-in with Facebook IDs.

In order to securely store data in DynamoDB, the design should use temporary AWS credentials. What feature of Amazon Cognito is used to obtain temporary credentials to access AWS services?

1: User Pools

2: Identity Pools

3: Key Pairs

4: SAML Identity Providers

32. Question

A website uses web servers behind an Internet-facing Elastic Load Balancer. What record set should be created to point the customer's DNS zone apex record at the ELB?

1: Create a PTR record pointing to the DNS name of the load balancer

2: Create an A record pointing to the DNS name of the load balancer

3: Create a CNAME record that is an Alias, and select the ELB DNS as a target

4: Create an A record that is an Alias, and select the ELB DNS as a target

33. Question

A Solutions Architect has been assigned the task of moving some sensitive documents into the AWS cloud. The security of the documents must be maintained.

Which AWS features can help ensure that the sensitive documents cannot be read even if they are compromised? (Select TWO)

1: AWS IAM Access Policy

2: Amazon S3 Server-Side Encryption

3: Amazon EBS snapshots

4: Amazon S3 cross region replication

5: Amazon EBS encryption with Customer Managed Keys

34. Question

A membership website has become quite popular and is gaining members quickly. The website currently runs on Amazon EC2 instances with one web server instance and one database instance running

MySQL. A Solutions Architect is concerned about the lack of high-availability in the current architecture.

What can the Solutions Architect do to easily enable high availability without making major changes to the architecture?

1: Create a Read Replica in another availability zone

2: Enable Multi-AZ for the MySQL instance

3: Install MySQL on an EC2 instance in the same availability zone and enable replication

4: Install MySQL on an EC2 instance in another availability zone and enable replication

35. Question

A Solutions Architect has setup a VPC with a public subnet and a VPN-only subnet. The public subnet is associated with a custom route table that has a route to an Internet Gateway. The VPN-only subnet is associated with the main route table and has a route to a virtual private gateway.

The Architect has created a new subnet in the VPC and launched an EC2 instance in it. However, the instance cannot connect to the Internet. What is the MOST likely reason?

1: The subnet has been automatically associated with the main route table which does not have a route to the Internet

2: The new subnet has not been associated with a route table

3: The Internet Gateway is experiencing connectivity problems

4: There is no NAT Gateway available in the new subnet so Internet connectivity is not possible

36. Question

A customer has a public-facing web application hosted on a single Amazon Elastic Compute Cloud (EC2) instance serving videos directly from an Amazon S3 bucket. Which of the following will restrict third parties from directly accessing the video assets in the bucket?

1: Launch the website Amazon EC2 instance using an IAM role that is authorized to access the videos

2: Restrict access to the bucket to the public CIDR range of the company locations

3: Use a bucket policy to only allow referrals from the main website URL

4: Use a bucket policy to only allow the public IP address of the Amazon EC2 instance hosting the customer website

37. Question

A Solutions Architect is creating an AWS CloudFormation template that will provision a new EC2 instance and new EBS volume. What must be specified to associate the block store with the instance?

1: Both the EC2 physical ID and the EBS physical ID

2: The EC2 physical ID

3: Both the EC2 logical ID and the EBS logical ID

4: The EC2 logical ID

38. Question

An application stores encrypted data in Amazon S3 buckets. A Solutions Architect needs to be able to query the encrypted data using SQL queries and write the encrypted results back the S3 bucket. As the data is sensitive fine-grained control must be implemented over access to the S3 bucket.

What combination of services represent the BEST options support these requirements? (Select TWO)

1: Use AWS Glue to extract the data, analyze it, and load it back to the S3 bucket

2: Use bucket ACLs to restrict access to the bucket

3: Use IAM policies to restrict access to the bucket

4: Use Athena for querying the data and writing the results back to the bucket

5: Use the AWS KMS API to query the encrypted data, and the S3 API for writing the results

39. Question

A Solutions Architect works for a systems integrator running a platform that stores medical records. The government security policy mandates

that patient data that contains personally identifiable information (PII) must be encrypted at all times, both at rest and in transit. Amazon S3 is used to back up data into the AWS cloud.

How can the Solutions Architect ensure the medical records are properly secured? (Select TWO)

1: Before uploading the data to S3 over HTTPS, encrypt the data locally using your own encryption keys

2: Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-128

3: Attach an encrypted EBS volume to an EC2 instance

4: Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-256

5: Upload the data using CloudFront with an EC2 origin

40. Question

A Solutions Architect is considering the best approach to enabling Internet access for EC2 instances in a private subnet. What advantages do NAT Gateways have over NAT Instances? (Select TWO)

1: Can be assigned to security groups

2: Can be used as a bastion host

3: Managed for you by AWS

4: Highly available within each AZ

5: Can be scaled up manually

41. Question

A Solutions Architect must design a solution for providing single sign-on to existing staff in a company. The staff manage on-premise web applications and also need access to the AWS management console to manage resources in the AWS cloud.

Which combination of services are BEST suited to delivering these requirements?

1: Use IAM and Amazon Cognito

2: Use your on-premise LDAP directory with IAM

3: Use the AWS Secure Token Service (STS) and SAML

4: Use IAM and MFA

42. Question

A Solutions Architect is designing a three-tier web application that includes an Auto Scaling group of Amazon EC2 Instances running behind an Elastic Load Balancer. The security team requires that all web servers must be accessible only through the Elastic Load Balancer and that none of the web servers are directly accessible from the Internet.

How should the Architect meet these requirements?

1: Create an Amazon CloudFront distribution in front of the Elastic Load Balancer

2: Configure the web servers' security group to deny traffic from the Internet

3: Configure the web tier security group to allow only traffic from the Elastic Load Balancer

4: Install a Load Balancer on an Amazon EC2 instance

43. Question

A Solutions Architect is creating a URL that lets users who sign in to the organization's network securely access the AWS Management Console. The URL will include a sign-in token that authenticates the user to AWS. Microsoft Active Directory Federation Services is being used as the identity provider (IdP).

Which of the steps below will the Solutions Architect need to include when developing the custom identity broker? (Select TWO)

1: Call the AWS federation endpoint and supply the temporary security credentials to request a sign-in token

2: Call the AWS Security Token Service (AWS STS) AssumeRole or GetFederationToken API operations to obtain temporary security credentials for the user

3: Assume an IAM Role through the console or programmatically with the AWS CLI, Tools for Windows PowerShell or API

4: Generate a pre-signed URL programmatically using the AWS SDK for Java or the AWS SDK for .NET

5: Delegate access to the IdP through the "Configure Provider" wizard in the IAM console

44. Question

Some Amazon ECS containers are running on a cluster using the EC2 launch type. The current configuration uses the container instance's IAM roles for assigning permissions to the containerized applications. A Solutions Architect needs to implement more granular permissions so that some applications can be assigned more restrictive permissions. How can this be achieved?

1: This cannot be changed as IAM roles can only be linked to container instances

2: This can be achieved using IAM roles for tasks, and splitting the containers according to the permissions required to different task definition profiles

3: This can be achieved by configuring a resource-based policy for each application

4: This can only be achieved using the Fargate launch type

45. Question

An application uses a combination of Reserved and On-Demand instances to handle typical load. The application involves performing analytics on a set of data. A Solutions Architect needs to temporarily deploy a large number of EC2 instances. The instances must be available for a short period of time until the analytics job is completed. If job completion is not time-critical, what is likely to be the MOST cost-effective choice of EC2 instance type to use for this requirement?

1: Use Spot instances

2: Use dedicated hosts

3: Use On-Demand instances

4: Use Reserved instances

46. Question

There is a problem with an EC2 instance that was launched by Amazon EC2 Auto Scaling. The EC2 status checks have reported that the instance is "Impaired". What action will EC2 Auto Scaling take?

1: Auto Scaling will perform Availability Zone rebalancing

2: It will wait a few minutes for the instance to recover and if it does not it will mark the instance for termination, terminate it, and then launch a replacement

3: Auto Scaling performs its own status checks and does not integrate with EC2 status checks

4: It will launch a new instance immediately and then mark the impaired one for replacement

47. Question

A pharmaceutical company uses a strict process for release automation that involves building and testing services in 3 separate VPCs. A peering topology is configured with VPC-A peered with VPC-B and VPC-B peered with VPC-C. The development team wants to modify the process so that they can release code directly from VPC-A to VPC-C.

How can this be accomplished?

1: Update VPC-Bs route table with peering targets for VPC-A and VPC-C and enable route propagation

2: Create a new VPC peering connection between VPC-A and VPC-C

3: Update the CIDR blocks to match to enable inter-VPC routing

4: Update VPC-As route table with an entry using the VPC peering as a target

48. Question

A Solutions Architect needs to work programmatically with IAM. Which feature of IAM allows direct access to the IAM web service using HTTPS to call service actions and what is the method of authentication that must be used? (Select TWO)

1: OpenID Connect

2: Query API

3: API Gateway

4: Access key ID and secret access key

5: IAM role

49. Question

The Systems Administrators in a company currently use Chef for configuration management of on-premise servers. Which AWS service can a Solutions Architect use that will provide a fully-managed configuration management service that will enable the use of existing Chef cookbooks?

1: Elastic Beanstalk

2: CloudFormation

3: OpsWorks for Chef Automate

4: Opsworks Stacks

50. Question

An Amazon RDS Multi-AZ deployment is running in an Amazon VPC. An outage occurs in the availability zone of the primary RDS database instance. What actions will take place in this circumstance? (Select TWO)

1: The failover mechanism automatically changes the DNS record of the DB instance to point to the standby DB instance

2: A failover will take place once the connection draining timer has expired

3: A manual failover of the DB instance will need to be initiated using Reboot with failover

4: The primary DB instance will switch over automatically to the standby replica

5: Due to the loss of network connectivity the process to switch to the standby replica cannot take place

51. Question

A Solutions Architect is designing a web-facing application. The application will run on Amazon EC2 instances behind Elastic Load Balancers in multiple regions in an active/passive configuration. The website address the application runs on is example.com. AWS Route 53 will be used to perform DNS resolution for the application.

How should the Solutions Architect configure AWS Route 53 in this scenario based on AWS best practices? (Select TWO)

1: Use a Failover Routing Policy

2: Set Evaluate Target Health to “No” for the primary

3: Use a Weighted Routing Policy
4: Connect the ELBs using Alias records
5: Connect the ELBs using CNAME records

52. Question

A Solutions Architect is designing a new retail website for a high-profile company. The company has previously been the victim of targeted distributed denial-of-service (DDoS) attacks and has requested that the design includes mitigation techniques.

Which of the following are the BEST techniques to help ensure the availability of the services is not compromised in an attack? (Select TWO)

1: Configure Auto Scaling with a high maximum number of instances to ensure it can scale accordingly
2: Use CloudFront for distributing both static and dynamic content
3: Use Spot instances to reduce the cost impact in case of attack
4: Use encryption on your EBS volumes
5: Use Placement Groups to ensure high bandwidth and low latency

53. Question

An application running on Amazon EC2 requires an EBS volume for saving structured data. The application vendor suggests that the performance of the disk should be up to 3 IOPS per GB. The capacity is expected to grow to 2 TB.

Taking into account cost effectiveness, which EBS volume type should be used?

1: Throughput Optimized HDD (ST1)
2: General Purpose (GP2)
3: Provisioned IOPS (Io1)
4: Cold HDD (SC1)

54. Question

An application in an Amazon VPC uses an Auto Scaling Group that spans 3 AZs and there are currently 4 Amazon EC2 instances running

in the group. What actions will Auto Scaling take, by default, if it needs to terminate an EC2 instance?

1: Randomly select one of the 3 AZs, and then terminate an instance in that AZ

2: Terminate the instance with the least active network connections. If multiple instances meet this criterion, one will be randomly selected

3: Send an SNS notification, if configured to do so

4: Wait for the cooldown period and then terminate the instance that has been running the longest

5: Terminate an instance in the AZ which currently has 2 running EC2 instances

55. Question

Several environments are being created in a single Amazon VPC. The Solutions Architect needs to implement a system of categorization that allows for identification of Amazon EC2 resources by business unit, owner, or environment.

Which AWS feature can be used?

1: Parameters

2: Metadata

3: Custom filters

4: Tags

56. Question

An organization has a data lake on Amazon S3 and needs to find a solution for performing in-place queries of the data assets in the data lake. The requirement is to perform both data discovery and SQL querying, and complex queries from a large number of concurrent users using BI tools.

What is the BEST combination of AWS services to use in this situation? (Select TWO)

1: RedShift Spectrum for the complex queries

2: Amazon Athena for the ad hoc SQL querying

3: AWS Glue for the ad hoc SQL querying

4: AWS Lambda for the complex queries

5: Amazon Kinesis for the complex queries

57. Question

When using throttling controls with API Gateway what happens when request submissions exceed the steady-state request rate and burst limits?

1: API Gateway fails the limit-exceeding requests and returns “429 Too Many Requests” error responses to the client

2: The requests will be buffered in a cache until the load reduces

3: API Gateway drops the requests and does not return a response to the client

4: API Gateway fails the limit-exceeding requests and returns “500 Internal Server Error” error responses to the client

58. Question

A Solutions Architect created a new VPC and setup an Auto Scaling Group to maintain a desired count of 2 Amazon EC2 instances. The security team has requested that the EC2 instances be located in a private subnet. To distribute load, an Internet-facing Application Load Balancer (ALB) is also required.

With the security team’s requirements in mind, what else needs to be done to get this configuration to work? (Select TWO)

1: Attach an Internet Gateway to the private subnets

2: Associate the public subnets with the ALB

3: Add an Elastic IP address to each EC2 instance in the private subnet

4: Add a NAT gateway to the private subnet

5: For each private subnet create a corresponding public subnet in the same AZ

59. Question

An application running AWS uses an Elastic Load Balancer (ELB) to distribute connections between EC2 instances. A Solutions Architect needs to record information on the requester, IP, and request type for connections made to the ELB. Additionally, the Architect will also need to perform some analysis on the log files.

Which AWS services and configuration options can be used to collect and then analyze the logs? (Select TWO)

1: Use EMR for analyzing the log files

2: Update the application to use DynamoDB for storing log files

3: Use Elastic Transcoder to analyze the log files

4: Enable Access Logs on the ELB and store the log files on S3

5: Enable Access Logs on the EC2 instances and store the log files on S3

60. Question

A Solutions Architect would like to store a backup of an Amazon EBS volume on Amazon S3. What is the easiest way of achieving this?

1: Use SWF to automatically create a backup of your EBS volumes and then upload them to an S3 bucket

2: You don't need to do anything, EBS volumes are automatically backed up by default

3: Write a custom script to automatically copy your data to an S3 bucket

4: Create a snapshot of the volume

61. Question

An application will gather data from a website hosted on an EC2 instance and write the data to an S3 bucket. The application will use API calls to interact with the EC2 instance and S3 bucket.

Which Amazon S3 access control method will be the MOST operationally efficient? (Select TWO)

1: Create a bucket policy

2: Grant programmatic access

3: Use key pairs

4: Grant AWS Management Console access

5: Create an IAM policy

62. Question

An Amazon CloudWatch alarm recently notified a Solutions Architect that the load on an Amazon DynamoDB table is getting close to the provisioned capacity for writes. The DynamoDB table is part of a two-

tier customer-facing application and is configured using provisioned capacity.

What will happen if the limit for the provisioned capacity for writes is reached?

1: The requests will be throttled, and fail with an HTTP 503 code (Service Unavailable)

2: DynamoDB scales automatically so there's no need to worry

3: The requests will be throttled, and fail with an HTTP 400 code (Bad Request) and a ProvisionedThroughputExceededException

4: The requests will succeed, and an HTTP 200 status code will be returned

63. Question

A Solutions Architect is creating the business process workflows associated with an order fulfilment system. What AWS service can assist with coordinating tasks across distributed application components?

1: AWS STS

2: Amazon SQS

3: Amazon SWF

4: Amazon SNS

64. Question

An EC2 instance in an Auto Scaling group is having some issues that are causing it to launch new instances based on the dynamic scaling policy. A Solutions Architect needs to troubleshoot the EC2 instance and prevent the Auto Scaling group from launching new instances temporarily.

What is the best method to accomplish this? (Select TWO)

1: Remove the EC2 instance from the Target Group

2: Disable the launch configuration associated with the EC2 instance

3: Place the EC2 instance that is experiencing issues into the Standby state

4: Suspend the scaling processes responsible for launching new instances

5: Disable the dynamic scaling policy

65. Question

An Amazon VPC has been deployed with private and public subnets. A MySQL database server running on an Amazon EC2 instance will soon be launched. According to AWS best practice, which subnet should the database server be launched into?

1: It doesn't matter

2: The private subnet

3: The public subnet

4: The subnet that is mapped to the primary AZ in the region

SET 4: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

A company is deploying an Amazon ElastiCache for Redis cluster. To enhance security a password should be required to access the database. What should the solutions architect use?

1: AWS Directory Service
2: AWS IAM Policy
3: Redis AUTH command
4: VPC Security Group

Answer: 3

Explanation:

Redis authentication tokens enable Redis to require a token (password) before allowing clients to execute commands, thereby improving data security.

You can require that users enter a token on a token-protected Redis server. To do this, include the parameter --auth-token (API: AuthToken) with the correct token when you create your replication group or cluster. Also include it in all subsequent commands to the replication group or cluster.

CORRECT: "Redis AUTH command" is the correct answer.

INCORRECT: "AWS Directory Service" is incorrect. This is a managed Microsoft Active Directory service and cannot add password protection to Redis.

INCORRECT: "AWS IAM Policy" is incorrect. You cannot use an IAM policy to enforce a password on Redis.

INCORRECT: "VPC Security Group" is incorrect. A security group protects at the network layer, it does not affect application authentication.

2. Question

To increase performance and redundancy for an application a company has decided to run multiple implementations in different AWS Regions behind network load balancers. The company currently advertise the

application using two public IP addresses from separate /24 address ranges and would prefer not to change these. Users should be directed to the closest available application endpoint.

Which actions should a solutions architect take? (Select TWO)

1: Create an Amazon Route 53 geolocation based routing policy

2: Create an AWS Global Accelerator and attach endpoints in each AWS Region

3: Assign new static anycast IP addresses and modify any existing pointers

4: Migrate both public IP addresses to the AWS Global Accelerator

5: Create PTR records to map existing public IP addresses to an Alias

Answer: 2,4

Explanation:

AWS Global Accelerator uses static IP addresses as fixed entry points for your application. You can migrate up to two /24 IPv4 address ranges and choose which /32 IP addresses to use when you create your accelerator.

This solution ensures the company can continue using the same IP addresses and they are able to direct traffic to the application endpoint in the AWS Region closest to the end user. Traffic is sent over the AWS global network for consistent performance.

CORRECT: "Create an AWS Global Accelerator and attach endpoints in each AWS Region" is a correct answer.

CORRECT: "Migrate both public IP addresses to the AWS Global Accelerator" is also a correct answer.

INCORRECT: "Create an Amazon Route 53 geolocation based routing policy" is incorrect. With this solution new IP addresses will be required as there will be application endpoints in different regions.

INCORRECT: "Assign new static anycast IP addresses and modify any existing pointers" is incorrect. This is unnecessary as you can bring your own IP addresses to AWS Global Accelerator and this is preferred in this scenario.

INCORRECT: "Create PTR records to map existing public IP addresses to an Alias" is incorrect. This is not a workable solution for mapping existing IP addresses to an Amazon Route 53 Alias.

3. Question

Three Amazon VPCs are used by a company in the same region. The company has two AWS Direct Connect connections to two separate company offices and wishes to share these with all three VPCs. A Solutions Architect has created an AWS Direct Connect gateway. How can the required connectivity be configured?

1: Associate the Direct Connect gateway to a transit gateway

2: Associate the Direct Connect gateway to a virtual private gateway in each VPC

3: Create a VPC peering connection between the VPCs and route entries for the Direct Connect Gateway

4: Create a transit virtual interface between the Direct Connect gateway and each VPC

Answer: 1

Explanation:

You can manage a single connection for multiple VPCs or VPNs that are in the same Region by associating a Direct Connect gateway to a transit gateway. The solution involves the following components:

- A transit gateway that has VPC attachments.
- A Direct Connect gateway.
- An association between the Direct Connect gateway and the transit gateway.
- A transit virtual interface that is attached to the Direct Connect gateway.

CORRECT: "Associate the Direct Connect gateway to a transit gateway" is the correct answer.

INCORRECT: "Associate the Direct Connect gateway to a virtual private gateway in each VPC" is incorrect. For VPCs in the same region a VPG is not necessary. A transit gateway can instead be configured.

INCORRECT: "Create a VPC peering connection between the VPCs and route entries for the Direct Connect Gateway" is incorrect. You cannot add route entries for a Direct Connect gateway to each VPC and enable routing. Use a transit gateway instead.

INCORRECT: "Create a transit virtual interface between the Direct Connect gateway and each VPC" is incorrect. The transit virtual interface is

attached to the Direct Connect gateway on the connection side, not the VPC/transit gateway side.

4. Question

A retail organization sends coupons out twice a week and this results in a predictable surge in sales traffic. The application runs on Amazon EC2 instances behind an Elastic Load Balancer. The organization is looking for ways to reduce cost without impacting performance or reliability. How can they achieve this goal?

1: Purchase scheduled reserved instances

2: Use a mixture of spot instances and on demand instances

3: Increase the instance size of the existing EC2 instances

4: Purchase Amazon EC2 dedicated hosts

Answer: 1

Explanation:

Scheduled Reserved Instances (Scheduled Instances) enable you to purchase capacity reservations that recur on a daily, weekly, or monthly basis, with a specified start time and duration, for a one-year term. You reserve the capacity in advance, so that you know it is available when you need it. You pay for the time that the instances are scheduled, even if you do not use them.

Scheduled Instances are a good choice for workloads that do not run continuously, but do run on a regular schedule. For example, you can use Scheduled Instances for an application that runs during business hours or for batch processing that runs at the end of the week.

CORRECT: "Purchase scheduled reserved instances" is the correct answer.

INCORRECT: "Use a mixture of spot instances and on demand instances" is incorrect. You can mix spot and on-demand in an auto scaling group. However, there's a risk the spot price may not be good and as this is a regular, predictable increase in traffic a scheduled reserved instance is a safer option.

INCORRECT: "Increase the instance size of the existing EC2 instances" is incorrect. This would add more cost all of the time rather than catering for the temporary increase in traffic.

INCORRECT: "Purchase Amazon EC2 dedicated hosts" is incorrect. This is not a way to save cost as dedicated hosts are much more expensive than shared hosts.

5. Question

Over 500 TB of data must be analyzed using standard SQL business intelligence tools. The dataset consists of a combination of structured data and unstructured data. The unstructured data is small and stored on Amazon S3. Which AWS services are most suitable for performing analytics on the data?

1: Amazon RDS MariaDB with Amazon Athena

2: Amazon DynamoDB with Amazon DynamoDB Accelerator (DAX)

3: Amazon ElastiCache for Redis with cluster mode enabled

4: Amazon Redshift with Amazon Redshift Spectrum

Answer: 4

Explanation:

Amazon Redshift is an enterprise-level, petabyte scale, fully managed data warehousing service. An Amazon Redshift data warehouse is an enterprise-class relational database query and management system. Redshift supports client connections with many types of applications, including business intelligence (BI), reporting, data, and analytics tools.

Using Amazon Redshift Spectrum, you can efficiently query and retrieve structured and semistructured data from files in Amazon S3 without having to load the data into Amazon Redshift tables. Redshift Spectrum queries employ massive parallelism to execute very fast against large datasets.

Used together, RedShift and RedShift spectrum are suitable for running massive analytics jobs on both the structured (RedShift data warehouse) and unstructured (Amazon S3) data.

CORRECT: "Amazon Redshift with Amazon Redshift Spectrum" is the correct answer.

INCORRECT: "Amazon RDS MariaDB with Amazon Athena" is incorrect. Amazon RDS is not suitable for analytics (OLAP) use cases as it is designed for transactional (OLTP) use cases. Athena can however be used for running SQL queries on data on S3.

INCORRECT: "Amazon DynamoDB with Amazon DynamoDB Accelerator (DAX)" is incorrect. This is an example of a non-relational DB with a caching layer and is not suitable for an OLAP use case.

INCORRECT: "Amazon ElastiCache for Redis with cluster mode enabled" is incorrect. This is an example of an in-memory caching service. It is good for performance for transactional use cases.

6. Question

An application is being monitored using Amazon GuardDuty. A Solutions Architect needs to be notified by email of medium to high severity events. How can this be achieved?

1: Configure an Amazon CloudWatch alarm that triggers based on a GuardDuty metric

2: Create an Amazon CloudWatch events rule that triggers an Amazon SNS topic

3: Create an Amazon CloudWatch Logs rule that triggers an AWS Lambda function

4: Configure an Amazon CloudTrail alarm the triggers based on GuardDuty API activity

Answer: 2

Explanation:

A CloudWatch Events rule can be used to set up automatic email notifications for Medium to High Severity findings to the email address of your choice. You simply create an Amazon SNS topic and then associate it with an Amazon CloudWatch events rule.

Note: step by step procedures for how to set this up can be found in the article linked in the references below.

CORRECT: "Create an Amazon CloudWatch events rule that triggers an Amazon SNS topic" is the correct answer.

INCORRECT: "Configure an Amazon CloudWatch alarm that triggers based on a GuardDuty metric" is incorrect. There is no metric for GuardDuty that can be used for specific findings.

INCORRECT: "Create an Amazon CloudWatch Logs rule that triggers an AWS Lambda function" is incorrect. CloudWatch logs is not the right

CloudWatch service to use. CloudWatch events is used for reacting to changes in service state.

INCORRECT: "Configure an Amazon CloudTrail alarm the triggers based on GuardDuty API activity" is incorrect. CloudTrail cannot be used to trigger alarms based on GuardDuty API activity.

7. Question

A company is migrating a decoupled application to AWS. The application uses a message broker based on the MQTT protocol. The application will be migrated to Amazon EC2 instances and the solution for the message broker must not require rewriting application code. Which AWS service can be used for the migrated message broker?

1: Amazon SQS

2: Amazon SNS

3: Amazon MQ

4: AWS Step Functions

Answer: 3

Explanation:

Amazon MQ is a managed message broker service for Apache ActiveMQ that makes it easy to set up and operate message brokers in the cloud. Connecting current applications to Amazon MQ is easy because it uses industry-standard APIs and protocols for messaging, including JMS, NMS, AMQP, STOMP, MQTT, and WebSocket. Using standards means that in most cases, there's no need to rewrite any messaging code when you migrate to AWS.

CORRECT: "Amazon MQ" is the correct answer.

INCORRECT: "Amazon SQS" is incorrect. This is an Amazon proprietary service and does not support industry-standard messaging APIs and protocols.

INCORRECT: "Amazon SNS" is incorrect. This is a notification service not a message bus.

INCORRECT: "AWS Step Functions" is incorrect. This is a workflow orchestration service, not a message bus.

8. Question

A HR application stores employment records on Amazon S3. Regulations mandate the records are retained for seven years. Once created the records are accessed infrequently for the first three months and then must be available within 10 minutes if required thereafter. Which lifecycle action meets the requirements whilst MINIMIZING cost?

1: Store the data in S3 Standard for 3 months, then transition to S3 Glacier

2: Store the data in S3 Standard-IA for 3 months, then transition to S3 Glacier

3: Store the data in S3 Standard for 3 months, then transition to S3 Standard-IA

4: Store the data in S3 Intelligent Tiering for 3 months, then transition to S3 Standard-IA

Answer: 2

Explanation:

The most cost-effective solution is to first store the data in S3 Standard-IA where it will be infrequently accessed for the first three months. Then, after three months expires, transition the data to S3 Glacier where it can be stored at lower cost for the remainder of the seven year period. Expedited retrieval can bring retrieval times down to 1-5 minutes.

CORRECT: "Store the data in S3 Standard-IA for 3 months, then transition to S3 Glacier" is the correct answer.

INCORRECT: "Store the data in S3 Standard for 3 months, then transition to S3 Glacier" is incorrect. S3 Standard is more costly than S3 Standard-IA and the data is only accessed infrequently.

INCORRECT: "Store the data in S3 Standard for 3 months, then transition to S3 Standard-IA" is incorrect. Neither storage class in this answer is the most cost-effective option.

INCORRECT: "Store the data in S3 Intelligent Tiering for 3 months, then transition to S3 Standard-IA" is incorrect. Intelligent tiering moves data between tiers based on access patterns, this is more costly and better suited to use cases that are unknown or unpredictable.

9. Question

A highly elastic application consists of three tiers. The application tier runs in an Auto Scaling group and processes data and writes it to an Amazon RDS MySQL database. The Solutions Architect wants to restrict access to the database tier to only accept traffic from the instances in the application tier. However, instances in the application tier are being constantly launched and terminated.

How can the Solutions Architect configure secure access to the database tier?

1: Configure the database security group to allow traffic only from the application security group

2: Configure the database security group to allow traffic only from port 3306

3: Configure a Network ACL on the database subnet to deny all traffic to ports other than 3306

4: Configure a Network ACL on the database subnet to allow all traffic from the application subnet

Answer: 1

Explanation:

The best option is to configure the database security group to only allow traffic that originates from the application security group. You can also define the destination port as the database port. This setup will allow any instance that is launched and attached to this security group to connect to the database.

CORRECT: "Configure the database security group to allow traffic only from the application security group" is the correct answer.

INCORRECT: "Configure the database security group to allow traffic only from port 3306" is incorrect. Port 3306 for MySQL should be the destination port, not the source.

INCORRECT: "Configure a Network ACL on the database subnet to deny all traffic to ports other than 3306" is incorrect. This does not restrict access specifically to the application instances.

INCORRECT: "Configure a Network ACL on the database subnet to allow all traffic from the application subnet" is incorrect. This does not restrict access specifically to the application instances.

10. Question

A Solutions Architect is rearchitecting an application with decoupling. The application will send batches of up to 1000 messages per second that must be received in the correct order by the consumers.
Which action should the Solutions Architect take?
1: Create an Amazon SQS Standard queue
2: Create an Amazon SNS topic
3: Create an Amazon SQS FIFO queue
4: Create an AWS Step Functions state machine

Answer: 3
Explanation:
Only FIFO queues guarantee the ordering of messages and therefore a standard queue would not work. The FIFO queue supports up to 3,000 messages per second with batching so this is a supported scenario.
CORRECT: "Create an Amazon SQS FIFO queue" is the correct answer.
INCORRECT: "Create an Amazon SQS Standard queue" is incorrect as it does not guarantee ordering of messages.
INCORRECT: "Create an Amazon SNS topic" is incorrect. SNS is a notification service and a message queue is a better fit for this use case.
INCORRECT: "Create an AWS Step Functions state machine" is incorrect. Step Functions is a workflow orchestration service and is not useful for this scenario.

11. Question
A Solutions Architect is designing an application that consists of AWS Lambda and Amazon RDS Aurora MySQL. The Lambda function must use database credentials to authenticate to MySQL and security policy mandates that these credentials must not be stored in the function code.
How can the Solutions Architect securely store the database credentials and make them available to the function?
1: Store the credentials in AWS Key Management Service and use environment variables in the function code pointing to KMS
2: Store the credentials in Systems Manager Parameter Store and update the function code and execution role

3: Use the AWSAuthenticationPlugin and associate an IAM user account in the MySQL database

4: Create an IAM policy and store the credentials in the policy. Attach the policy to the Lambda function execution role

Answer: 2

Explanation:

In this case the scenario requires that credentials are used for authenticating to MySQL. The credentials need to be securely stored outside of the function code. Systems Manager Parameter Store provides secure, hierarchical storage for configuration data management and secrets management.

You can easily reference the parameters from services including AWS Lambda.

CORRECT: "Store the credentials in Systems Manager Parameter Store and update the function code and execution role" is the correct answer.

INCORRECT: "Store the credentials in AWS Key Management Service and use environment variables in the function code pointing to KMS" is incorrect. You cannot store credentials in KMS, it is used for creating and managing encryption keys

INCORRECT: "Use the AWSAuthenticationPlugin and associate an IAM user account in the MySQL database" is incorrect. This is a great way to securely authenticate to RDS using IAM users or roles. However, in this case the scenario requires database credentials to be used by the function.

INCORRECT: "Create an IAM policy and store the credentials in the policy. Attach the policy to the Lambda function execution role" is incorrect. You cannot store credentials in IAM policies.

12. Question

A company are finalizing their disaster recovery plan. A limited set of core services will be replicated to the DR site ready to seamlessly take over the in the event of a disaster. All other services will be switched off.

Which DR strategy is the company using?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

Answer: 2

Explanation:

In this DR approach, you simply replicate part of your IT structure for a limited set of core services so that the AWS cloud environment seamlessly takes over in the event of a disaster.

A small part of your infrastructure is always running simultaneously syncing mutable data (as databases or documents), while other parts of your infrastructure are switched off and used only during testing.

Unlike a backup and recovery approach, you must ensure that your most critical core elements are already configured and running in AWS (the pilot light). When the time comes for recovery, you can rapidly provision a full-scale production environment around the critical core.

CORRECT: "Pilot light" is the correct answer.

INCORRECT: "Backup and restore" is incorrect. This is the lowest cost DR approach that simply entails creating online backups of all data and applications.

INCORRECT: "Warm standby" is incorrect. The term warm standby is used to describe a DR scenario in which a scaled-down version of a fully functional environment is always running in the cloud.

INCORRECT: "Multi-site" is incorrect. A multi-site solution runs on AWS as well as on your existing on-site infrastructure in an active- active configuration.

13. Question

An application that runs a computational fluid dynamics workload uses a tightly-coupled HPC architecture that uses the MPI protocol and runs across many nodes. A service-managed deployment is required to minimize operational overhead.

Which deployment option is MOST suitable for provisioning and managing the resources required for this use case?

1: Use Amazon EC2 Auto Scaling to deploy instances in multiple subnets

2: Use AWS CloudFormation to deploy a Cluster Placement Group on EC2

3: Use AWS Batch to deploy a multi-node parallel job

4: Use AWS Elastic Beanstalk to provision and manage the EC2 instances

Answer: 3

Explanation:

AWS Batch Multi-node parallel jobs enable you to run single jobs that span multiple Amazon EC2 instances. With AWS Batch multi-node parallel jobs, you can run large-scale, tightly coupled, high performance computing applications and distributed GPU model training without the need to launch, configure, and manage Amazon EC2 resources directly.

An AWS Batch multi-node parallel job is compatible with any framework that supports IP-based, internode communication, such as Apache MXNet, TensorFlow, Caffe2, or Message Passing Interface (MPI).

This is the most efficient approach to deploy the resources required and supports the application requirements most effectively.

CORRECT: "Use AWS Batch to deploy a multi-node parallel job" is the correct answer.

INCORRECT: "Use Amazon EC2 Auto Scaling to deploy instances in multiple subnets " is incorrect. This is not the best solution for a tightly-coupled HPC workload with specific requirements such as MPI support.

INCORRECT: "Use AWS CloudFormation to deploy a Cluster Placement Group on EC2" is incorrect. This would deploy a cluster placement group but not manage it. AWS Batch is a better fit for large scale workloads such as this.

INCORRECT: "Use AWS Elastic Beanstalk to provision and manage the EC2 instances" is incorrect. You can certainly provision and manage EC2 instances with Elastic Beanstalk but this scenario is for a specific workload that requires MPI support and managing a HPC deployment across a large number of nodes. AWS Batch is more suitable.

14. Question

A Solutions Architect is designing an application that will run on an Amazon EC2 instance. The application must asynchronously invoke and AWS Lambda function to analyze thousands of .CSV files. The services should be decoupled.

Which service can be used to decouple the compute services?

1: Amazon SQS

2: Amazon SNS
3: Amazon Kinesis
4: Amazon OpsWorks

Answer:

Explanation:

You can use a Lambda function to process Amazon Simple Notification Service notifications. Amazon SNS supports Lambda functions as a target for messages sent to a topic. This solution decouples the Amazon EC2 application from Lambda and ensures the Lambda function is invoked.

CORRECT: "Amazon SNS" is the correct answer.

INCORRECT: "Amazon SQS" is incorrect. You cannot invoke a Lambda function using Amazon SQS. Lambda can be configured to poll a queue, as SQS is pull-based, but it is not push-based like SNS which is what this solution requires.

INCORRECT: "Amazon Kinesis" is incorrect as this service is used for ingesting and processing real time streaming data, it is not a suitable service to be used solely for invoking a Lambda function.

INCORRECT: "Amazon OpsWorks" is incorrect as this service is used for configuration management of systems using Chef or Puppet.

15. Question

A large MongoDB database running on-premises must be migrated to Amazon DynamoDB within the next few weeks. The database is too large to migrate over the company's limited internet bandwidth so an alternative solution must be used. What should a Solutions Architect recommend?

1: Setup an AWS Direct Connect and migrate the database to Amazon DynamoDB using the AWS Database Migration Service (DMS)

2: Use the Schema Conversion Tool (SCT) to extract and load the data to an AWS Snowball Edge device. Use the AWS Database Migration Service (DMS) to migrate the data to Amazon DynamoDB

3: Enable compression on the MongoDB database and use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon DynamoDB

4: Use the AWS Database Migration Service (DMS) to extract and load the data to an AWS Snowball Edge device. Complete the migration to Amazon DynamoDB using AWS DMS in the AWS Cloud

Answer: 2

Explanation:

Larger data migrations with AWS DMS can include many terabytes of information. This process can be cumbersome due to network bandwidth limits or just the sheer amount of data. AWS DMS can use Snowball Edge and Amazon S3 to migrate large databases more quickly than by other methods.

When you're using an Edge device, the data migration process has the following stages:

- You use the AWS Schema Conversion Tool (AWS SCT) to extract the data locally and move it to an Edge device.
- You ship the Edge device or devices back to AWS.
- After AWS receives your shipment, the Edge device automatically loads its data into an Amazon S3 bucket.
- AWS DMS takes the files and migrates the data to the target data store. If you are using change data capture (CDC), those updates are written to the Amazon S3 bucket and then applied to the target data store.

CORRECT: "Use the Schema Conversion Tool (SCT) to extract and load the data to an AWS Snowball Edge device. Use the AWS Database Migration Service (DMS) to migrate the data to Amazon DynamoDB" is the correct answer.

INCORRECT: "Setup an AWS Direct Connect and migrate the database to Amazon DynamoDB using the AWS Database Migration Service (DMS)" is incorrect as Direct Connect connections can take several weeks to implement.

INCORRECT: "Enable compression on the MongoDB database and use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon DynamoDB" is incorrect. It’s unlikely that compression is going to make the difference and the company want to avoid the internet link as stated in the scenario.

INCORRECT: "Use the AWS Database Migration Service (DMS) to extract and load the data to an AWS Snowball Edge device. Complete the

migration to Amazon DynamoDB using AWS DMS in the AWS Cloud" is incorrect. This is the wrong method; the Solutions Architect should use the SCT to extract and load to Snowball Edge and then AWS DMS in the AWS Cloud.

16. Question

Every time an item in an Amazon DynamoDB table is modified a record must be retained for compliance reasons. What is the most efficient solution to recording this information?

1: Enable Amazon CloudWatch Logs. Configure an AWS Lambda function to monitor the log files and record deleted item data to an Amazon S3 bucket

2: Enable DynamoDB Streams. Configure an AWS Lambda function to poll the stream and record the modified item data to an Amazon S3 bucket

3: Enable Amazon CloudTrail. Configure an Amazon EC2 instance to monitor activity in the CloudTrail log files and record changed items in another DynamoDB table

4: Enable DynamoDB Global Tables. Enable DynamoDB streams on the multi-region table and save the output directly to an Amazon S3 bucket

Answer: 2

Explanation:

Amazon DynamoDB Streams captures a time-ordered sequence of item-level modifications in any DynamoDB table and stores this information in a log for up to 24 hours. Applications can access this log and view the data items as they appeared before and after they were modified, in near-real time.

CORRECT: "Enable DynamoDB Streams. Configure an AWS Lambda function to poll the stream and record the modified item data to an Amazon S3 bucket" is the correct answer.

INCORRECT: "Enable Amazon CloudWatch Logs. Configure an AWS Lambda function to monitor the log files and record deleted item data to an Amazon S3 bucket" is incorrect. The deleted item data will not be recorded in CloudWatch Logs.

INCORRECT: "Enable Amazon CloudTrail. Configure an Amazon EC2 instance to monitor activity in the CloudTrail log files and record changed

items in another DynamoDB table" is incorrect. CloudTrail records API actions so it will not record the data from the item that was modified.

INCORRECT: "Enable DynamoDB Global Tables. Enable DynamoDB streams on the multi-region table and save the output directly to an Amazon S3 bucket" is incorrect. Global Tables is used for creating a multi-region, multi-master database. It is of no additional value for this requirement as you could just enable DynamoDB streams on the main table. You also cannot save modified data straight to an S3 bucket.

17. Question

An application in a private subnet needs to query data in an Amazon DynamoDB table. Use of the DynamoDB public endpoints must be avoided. What is the most EFFICIENT and secure method of enabling access to the table?

1: Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)

2: Create a gateway VPC endpoint and add an entry to the route table

3: Create a private Amazon DynamoDB endpoint and connect to it using an AWS VPN

4: Create a software VPN between DynamoDB and the application in the private subnet

Answer: 2

Explanation:

A VPC endpoint enables you to privately connect your VPC to supported AWS services and VPC endpoint services powered by AWS PrivateLink without requiring an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection.

Instances in your VPC do not require public IP addresses to communicate with resources in the service. Traffic between your VPC and the other service does not leave the Amazon network.

With a gateway endpoint you configure your route table to point to the endpoint. Amazon S3 and DynamoDB use gateway endpoints.

CORRECT: "Create a gateway VPC endpoint and add an entry to the route table" is the correct answer.

INCORRECT: "Create an interface VPC endpoint in the VPC with an Elastic Network Interface (ENI)" is incorrect. This would be used for services that are supported by interface endpoints, not gateway endpoints.

INCORRECT: "Create a private Amazon DynamoDB endpoint and connect to it using an AWS VPN" is incorrect. You cannot create an Amazon DynamoDB private endpoint and connect to it over VPN. Private endpoints are VPC endpoints and are connected to by instances in subnets via route table entries or via ENIs (depending on which service).

INCORRECT: "Create a software VPN between DynamoDB and the application in the private subnet" is incorrect. You cannot create a software VPN between DynamoDB and an application.

18. Question

A Solutions Architect needs to select a low-cost, short-term option for adding resilience to an AWS Direct Connect connection. What is the MOST cost-effective solution to provide a backup for the Direct Connect connection?

1: Implement a second AWS Direct Connection

2: Implement an IPSec VPN connection and use the same BGP prefix

3: Configure AWS Transit Gateway with an IPSec VPN backup

4: Configure an IPSec VPN connection over the Direct Connect link

Answer: 2

Explanation:

This is the most cost-effective solution. With this option both the Direct Connect connection and IPSec VPN are active and being advertised using the Border Gateway Protocol (BGP). The Direct Connect link will always be preferred unless it is unavailable.

CORRECT: "Implement an IPSec VPN connection and use the same BGP prefix" is the correct answer.

INCORRECT: "Implement a second AWS Direct Connection" is incorrect. This is not a short-term or low-cost option as it takes time to implement and is costly.

INCORRECT: "Configure AWS Transit Gateway with an IPSec VPN backup" is incorrect. This is a workable solution and provides some advantages. However, you do need to pay for the Transit Gateway so it is not

the most cost-effective option and probably not suitable for a short-term need.

INCORRECT: "Configure an IPSec VPN connection over the Direct Connect link" is incorrect. This is not a solution to the problem as the VPN connection is going over the Direct Connect link. This is something you might do to add encryption to Direct Connect but it doesn't make it more resilient.

19. Question

The disk configuration for an Amazon EC2 instance must be finalized. The instance will be running an application that requires heavy read/write IOPS. A single volume is required that is 500 GiB in size and needs to support 20,000 IOPS.

What EBS volume type should be selected?

1: EBS General Purpose SSD

2: EBS Provisioned IOPS SSD

3: EBS General Purpose SSD in a RAID 1 configuration

4: EBS Throughput Optimized HDD

Answer: 2

Explanation:

This is simply about understanding the performance characteristics of the different EBS volume types. The only EBS volume type that supports over 16,000 IOPS per volume is Provisioned IOPS SSD.

SSD, General Purpose – gp2

– Volume size 1 GiB – 16 TiB.

– Max IOPS/volume 16,000.

SSD, Provisioned IOPS – i01

– Volume size 4 GiB – 16 TiB.

– Max IOPS/volume 64,000.

– **HDD, Throughput Optimized – (st1)**

– Volume size 500 GiB – 16 TiB.

Throughput measured in MB/s, and includes the ability to burst up to 250 MB/s per TB, with a baseline throughput of 40 MB/s per TB and a maximum throughput of 500 MB/s per volume.

HDD, Cold – (sc1)

– Volume size 500 GiB – 16 TiB.

Lowest cost storage – cannot be a boot volume.

– These volumes can burst up to 80 MB/s per TB, with a baseline throughput of 12 MB/s per TB and a maximum throughput of 250 MB/s per volume

HDD, Magnetic – Standard – cheap, infrequently accessed storage – lowest cost storage that can be a boot volume.

CORRECT: "EBS Provisioned IOPS SSD" is the correct answer.

INCORRECT: "EBS General Purpose SSD" is incorrect as the max IOPS is 16,000.

INCORRECT: "EBS General Purpose SSD in a RAID 1 configuration" is incorrect. RAID 1 is mirroring and does not increase the amount of IOPS you can generate.

INCORRECT: "EBS Throughput Optimized HDD" is incorrect as this type of disk does not support the IOPS requirement.

20. Question

A new application you are designing will store data in an Amazon Aurora MySQL DB. You are looking for a way to enable inter-region disaster recovery capabilities with fast replication and fast failover. Which of the following options is the BEST solution?

1: Use Amazon Aurora Global Database

2: Enable Multi-AZ for the Aurora DB

3: Create an EBS backup of the Aurora volumes and use cross-region replication to copy the snapshot

4: Create a cross-region Aurora Read Replica

Answer: 1

Explanation:

Amazon Aurora Global Database is designed for globally distributed applications, allowing a single Amazon Aurora database to span multiple AWS regions. It replicates your data with no impact on database performance, enables fast local reads with low latency in each region, and provides disaster recovery from region-wide outages.

Aurora Global Database uses storage-based replication with typical latency of less than 1 second, using dedicated infrastructure that leaves your database fully available to serve application workloads. In the unlikely event of a regional degradation or outage, one of the secondary regions can be promoted to full read/write capabilities in less than 1 minute.

CORRECT: "Use Amazon Aurora Global Database" is the correct answer.

INCORRECT: "Enable Multi-AZ for the Aurora DB" is incorrect. Enabling Multi-AZ for the Aurora DB would provide AZ-level resiliency within the region not across regions.

INCORRECT: "Create an EBS backup of the Aurora volumes and use cross-region replication to copy the snapshot" is incorrect. Though you can take a DB snapshot and replicate it across regions, it does not provide an automated solution and it would not enable fast failover

INCORRECT: "Create a cross-region Aurora Read Replica" is incorrect. This solution would not provide the fast storage replication and fast failover capabilities of the Aurora Global Database and is therefore not the best option.

21. Question

A Solutions Architect regularly launches EC2 instances manually from the console and wants to streamline the process to reduce administrative overhead. Which feature of EC2 enables storing of settings such as AMI ID, instance type, key pairs and Security Groups?

1: Placement Groups

2: Launch Templates

3: Run Command

4: Launch Configurations

Answer: 2

Explanation:

Launch templates enable you to store launch parameters so that you do not have to specify them every time you launch an instance. When you launch an instance using the Amazon EC2 console, an AWS SDK, or a command line tool, you can specify the launch template to use.

CORRECT: "Launch Templates" is the correct answer.

INCORRECT: "Placement Groups" is incorrect. You can launch or start instances in a *placement group* , which determines how instances are placed on underlying hardware.

INCORRECT: "Run Command" is incorrect. Run Command automates common administrative tasks, and lets you perform ad hoc configuration changes at scale.

INCORRECT: "Launch Configurations" is incorrect. Launch Configurations are used with Auto Scaling Groups.

22. Question

You recently noticed that your Network Load Balancer (NLB) in one of your VPCs is not distributing traffic evenly between EC2 instances in your AZs. There are an odd number of EC2 instances spread across two AZs. The NLB is configured with a TCP listener on port 80 and is using active health checks.

What is the most likely problem?

1: There is no HTTP listener

2: Health checks are failing in one AZ due to latency

3: NLB can only load balance within a single AZ

4: Cross-zone load balancing is disabled

Answer: 4

Explanation:

Without cross-zone load balancing enabled, the NLB will distribute traffic 50/50 between AZs. As there are an odd number of instances across the two AZs some instances will not receive any traffic. Therefore, enabling cross-zone load balancing will ensure traffic is distributed evenly between available instances in all AZs.

CORRECT: "Cross-zone load balancing is disabled" is the correct answer.

INCORRECT: "There is no HTTP listener" is incorrect. Listeners are used to receive incoming connections. An NLB listens on TCP not on HTTP therefore having no HTTP listener is not the issue here.

INCORRECT: "Health checks are failing in one AZ due to latency" is incorrect. If health checks fail this will cause the NLB to stop sending traffic to these instances. However, the health check packets are very small and it is unlikely that latency would be the issue within a region.

INCORRECT: "NLB can only load balance within a single AZ" is incorrect. An NLB can load balance across multiple AZs just like the other ELB types.

23. Question

A Solutions Architect is creating a design for a multi-tiered serverless application. Which two services form the application facing services from the AWS serverless infrastructure? (Select TWO)

1: API Gateway
2: AWS Cognito
3: AWS Lambda
4: Amazon ECS
5: Elastic Load Balancer

Answer: 1,3

Explanation:

The only application services here are API Gateway and Lambda and these are considered to be serverless services.

CORRECT: "API Gateway" is a correct answer.

CORRECT: "AWS Lambda" is also a correct answer.

INCORRECT: "AWS Cognito" is incorrect. AWS Cognito is used for providing authentication services for web and mobile apps.

INCORRECT: "Amazon ECS" is incorrect. ECS provides the platform for running containers and uses Amazon EC2 instances.

INCORRECT: "Elastic Load Balancer" is incorrect. ELB provides distribution of incoming network connections and also uses Amazon EC2 instances.

24. Question

A Solutions Architect attempted to restart a stopped EC2 instance and it immediately changed from a pending state to a terminated state. What are the most likely explanations? (Select TWO)

1: You've reached your EBS volume limit
2: An EBS snapshot is corrupt

3: AWS does not currently have enough available On-Demand capacity to service your request

4: You have reached the limit on the number of instances that you can launch in a region

5: The AMI is unsupported

Answer: 1,2

Explanation:

The following are a few reasons why an instance might immediately terminate:

- You've reached your EBS volume limit.
- An EBS snapshot is corrupt.
- The root EBS volume is encrypted and you do not have permissions to access the KMS key for decryption.
- The instance store-backed AMI that you used to launch the instance is missing a required part (an image.part.xx file).

CORRECT: "You've reached your EBS volume limit" is a correct answer.

CORRECT: "An EBS snapshot is corrupt" is also a correct answer.

INCORRECT: "AWS does not currently have enough available On-Demand capacity to service your request" is incorrect. If AWS does not have capacity available a InsufficientInstanceCapacity error will be generated when you try to launch a new instance or restart a stopped instance.

INCORRECT: "You have reached the limit on the number of instances that you can launch in a region" is incorrect. If you've reached the limit on the number of instances you can launch in a region you get an InstanceLimitExceeded error when you try to launch a new instance or restart a stopped instance.

INCORRECT: "The AMI is unsupported" is incorrect. It is possible that an instance type is not supported by an AMI and this can cause an "UnsupportedOperation" client error. However, in this case the instance was previously running (it is in a stopped state) so it is unlikely that this is the issue.

25. Question

One of the applications you manage on RDS uses the MySQL DB and has been suffering from performance issues. You would like to setup a

reporting process that will perform queries on the database but you're concerned that the extra load will further impact the performance of the DB and may lead to poor customer experience.

What would be the best course of action to take so you can implement the reporting process?

1: Configure Multi-AZ to setup a secondary database instance in another region

2: Deploy a Read Replica to setup a secondary read-only database instance

3: Deploy a Read Replica to setup a secondary read and write database instance

4: Configure Multi-AZ to setup a secondary database instance in another Availability Zone

Answer: 2

Explanation:

The reporting process will perform queries on the database but not writes. Therefore you can use a read replica which will provide a secondary read-only database and configure the reporting process to use the read replica.

Multi-AZ is used for implementing fault tolerance. With Multi-AZ you can failover to a DB in another AZ within the region in the event of a failure of the primary DB. However, you can only read and write to the primary DB so still need a read replica to offload the reporting job

CORRECT: "Deploy a Read Replica to setup a secondary read-only database instance" is the correct answer.

INCORRECT: "Configure Multi-AZ to setup a secondary database instance in another region" is incorrect as described above.

INCORRECT: "Deploy a Read Replica to setup a secondary read and write database instance" is incorrect. Read replicas are for workload offloading only and do not provide the ability to write to the database.

INCORRECT: "Configure Multi-AZ to setup a secondary database instance in another Availability Zone" is incorrect as described above.

26. Question

A Solutions Architect is building a new Amazon Elastic Container Service (ECS) cluster. The ECS instances are running the EC2 launch type and load balancing is required to distribute connections to the

tasks. It is required that the mapping of ports is performed dynamically and connections are routed to different groups of servers based on the path in the URL.

Which AWS service should the Solutions Architect choose to fulfil these requirements?

1: An Amazon ECS Service

2: Application Load Balancer

3: Network Load Balancer

4: Classic Load Balancer

Answer: 2

Explanation:

An ALB allows containers to use dynamic host port mapping so that multiple tasks from the same service are allowed on the same container host. An ALB can also route requests based on the content of the request in the host field: host-based or path-based.

The NLB and CLB types of Elastic Load Balancer do not support path-based routing or host-based routing so they cannot be used for this use case.

CORRECT: "Application Load Balancer" is the correct answer.

INCORRECT: "ECS Services" is incorrect. An Amazon ECS service enables you to run and maintain a specified number of instances of a task definition simultaneously in an Amazon ECS cluster. It does not distributed connections to tasks.

INCORRECT: "Network Load Balancer" is incorrect as described above.

INCORRECT: "Classic Load Balancer" is incorrect as described above.

27. Question

A Solutions Architect needs to connect from an office location to a Linux instance that is running in a public subnet in an Amazon VPC using the Internet. Which of the following items are required to enable this access? (Select TWO)

1: A bastion host

2: A NAT Gateway

3: A Public or Elastic IP address on the EC2 instance

4: An Internet Gateway attached to the VPC and route table attached to the public subnet pointing to it
5: An IPSec VPN

Answer: 3,4

Explanation:

A public subnet is a subnet that has an Internet Gateway attached and "Enable auto-assign public IPv4 address" enabled. Instances require a public IP or Elastic IP address. It is also necessary to have the subnet route table updated to point to the Internet Gateway and security groups and network ACLs must be configured to allow the SSH traffic on port 22.

CORRECT: "A Public or Elastic IP address on the EC2 instance" is a correct answer.

CORRECT: "An Internet Gateway attached to the VPC and route table attached to the public subnet pointing to it" is also a correct answer.

INCORRECT: "A bastion host" is incorrect. A bastion host can be used to access instances in private subnets but is not required for instances in public subnets.

INCORRECT: "A NAT Gateway" is incorrect. A NAT Gateway allows instances in private subnets to access the Internet, it is not used for remote access.

INCORRECT: "An IPSec VPN" is incorrect. An IPSec VPN is not required to connect to an instance in a public subnet.

28. Question

An Auto Scaling Group is unable to respond quickly enough to load changes resulting in lost messages from another application tier. The messages are typically around 128KB in size.

What is the best design option to prevent the messages from being lost?

1: Store the messages on Amazon S3
2: Launch an Elastic Load Balancer
3: Store the messages on an SQS queue
4: Use larger EC2 instance sizes

Answer: 3

Explanation:

In this circumstance the ASG cannot launch EC2 instances fast enough. You need to be able to store the messages somewhere so they don't get lost whilst the EC2 instances are launched. This is a classic use case for decoupling and SQS is designed for exactly this purpose.

Amazon Simple Queue Service (Amazon SQS) is a web service that gives you access to message queues that store messages waiting to be processed. SQS offers a reliable, highly-scalable, hosted queue for storing messages in transit between computers. An SQS queue can be used to create distributed/decoupled applications.

CORRECT: "Store the messages on an SQS queue" is the correct answer.

INCORRECT: "Store the messages on Amazon S3" is incorrect. Storing the messages on S3 is potentially feasible but SQS is the preferred solution as it is designed for decoupling. If the messages are over 256KB and therefore cannot be stored in SQS, you may want to consider using S3 and it can be used in combination with SQS by using the Amazon SQS Extended Client Library for Java.

INCORRECT: "Launch an Elastic Load Balancer" is incorrect. An ELB can help to distribute incoming connections to the back-end EC2 instances however if the ASG is not scaling fast enough then there aren't enough resources for the ELB to distribute traffic to.

INCORRECT: "Use larger EC2 instance sizes" is incorrect. Scaling horizontally and decoupling will have a greater effect over using larger instance sizes.

29. Question

A Solutions Architect needs to run a production batch process quickly that will use several EC2 instances. The process cannot be interrupted and must be completed within a short time period.

What is likely to be the MOST cost-effective choice of EC2 instance type to use for this requirement?

1: Reserved instances

2: Spot instances

3: Flexible instances

4: On-demand instances

Answer: 4

Explanation:

The key requirements here are that you need to deploy several EC2 instances quickly to run the batch process and you must ensure that the job completes. The on-demand pricing model is the best for this ad-hoc requirement as though spot pricing may be cheaper you cannot afford to risk that the instances are terminated by AWS when the market price increases.

CORRECT: "On-demand instances" is the correct answer.

INCORRECT: "Reserved instances" is incorrect. Reserved instances are used for longer more stable requirements where you can get a discount for a fixed 1 or 3 year term. This pricing model is not good for temporary requirements.

INCORRECT: "Spot instances" is incorrect. Spot instances provide a very low hourly compute cost and are good when you have flexible start and end times. They are often used for use cases such as grid computing and high-performance computing (HPC).

INCORRECT: "Flexible instances" is incorrect. There is no such thing as a "flexible instance".

30. Question

A Solutions Architect would like to implement a method of automating the creation, retention, and deletion of backups for the Amazon EBS volumes in an Amazon VPC. What is the easiest way to automate these tasks using AWS tools?

1: Configure EBS volume replication to create a backup on Amazon S3

2: Use the EBS Data Lifecycle Manager (DLM) to manage snapshots of the volumes

3: Create a scheduled job and run the AWS CLI command "create-backup" to take backups of the EBS volumes

4: Create a scheduled job and run the AWS CLI command "create-snapshot" to take backups of the EBS volumes

Answer: 2

Explanation:

You backup EBS volumes by taking snapshots. This can be automated via the AWS CLI command "create-snapshot". However the question is asking

for a way to automate not just the creation of the snapshot but the retention and deletion too.

The EBS Data Lifecycle Manager (DLM) can automate all of these actions for you and this can be performed centrally from within the management console.

CORRECT: "Use the EBS Data Lifecycle Manager (DLM) to manage snapshots of the volumes" is the correct answer.

INCORRECT: "Configure EBS volume replication to create a backup on S3" is incorrect. You cannot configure volume replication for EBS volumes using AWS tools.

INCORRECT: "Create a scheduled job and run the AWS CLI command “create-backup” to take backups of the EBS volumes" is incorrect. This is the wrong command (use create-snapshot) and is not the easiest method.

INCORRECT: "Create a scheduled job and run the AWS CLI command “create-snapshot” to take backups of the EBS volumes" is incorrect. This is not the easiest method, DLM would be a much better solution.

31. Question

A mobile app uploads usage information to a database. Amazon Cognito is being used for authentication, authorization and user management and users sign-in with Facebook IDs.

In order to securely store data in DynamoDB, the design should use temporary AWS credentials. What feature of Amazon Cognito is used to obtain temporary credentials to access AWS services?

1: User Pools

2: Identity Pools

3: Key Pairs

4: SAML Identity Providers

Answer: 2

Explanation:

Amazon Cognito identity pools provide temporary AWS credentials for users who are guests (unauthenticated) and for users who have been authenticated and received a token. An identity pool is a store of user identity data specific to your account.

With an identity pool, users can obtain temporary AWS credentials to access AWS services, such as Amazon S3 and DynamoDB.

CORRECT: "Identity Pools" is the correct answer.

INCORRECT: "User Pools" is incorrect. A user pool is a user directory in Amazon Cognito. With a user pool, users can sign in to web or mobile apps through Amazon Cognito, or federate through a third-party identity provider (IdP).

INCORRECT: "Key Pairs" is incorrect. Key pairs are used in Amazon EC2 for access to instances.

INCORRECT: "SAML Identity Providers" is incorrect. SAML Identity Providers are supported IDPs for identity pools but cannot be used for gaining temporary credentials for AWS services.

32. Question

A website uses web servers behind an Internet-facing Elastic Load Balancer. What record set should be created to point the customer's DNS zone apex record at the ELB?

1: Create a PTR record pointing to the DNS name of the load balancer

2: Create an A record pointing to the DNS name of the load balancer

3: Create a CNAME record that is an Alias, and select the ELB DNS as a target

4: Create an A record that is an Alias, and select the ELB DNS as a target

Answer: 4

Explanation:

An Alias record can be used for resolving apex or naked domain names (e.g. example.com). You can create an A record that is an Alias that uses the customer's website zone apex domain name and map it to the ELB DNS name.

CORRECT: "Create an A record that is an Alias, and select the ELB DNS as a target" is the correct answer.

INCORRECT: "Create a PTR record pointing to the DNS name of the load balancer" is incorrect. PTR records are reverse lookup records where you use the IP to find the DNS name.

INCORRECT: "Create an A record pointing to the DNS name of the load balancer" is incorrect. A standard A record maps the DNS domain name to the IP address of a resource. You cannot obtain the IP of the ELB so you must use an Alias record which maps the DNS domain name of the customer's website to the ELB DNS name (rather than its IP).

INCORRECT: "Create a CNAME record that is an Alias, and select the ELB DNS as a target" is incorrect. A CNAME record can't be used for resolving apex or naked domain names.

33. Question

A Solutions Architect has been assigned the task of moving some sensitive documents into the AWS cloud. The security of the documents must be maintained.

Which AWS features can help ensure that the sensitive documents cannot be read even if they are compromised? (Select TWO)

1: AWS IAM Access Policy

2: Amazon S3 Server-Side Encryption

3: Amazon EBS snapshots

4: Amazon S3 cross region replication

5: Amazon EBS encryption with Customer Managed Keys

Answer: 2,5

Explanation:

It is not specified what types of documents are being moved into the cloud or what services they will be placed on. Therefore we can assume that options include S3 and EBS. To prevent the documents from being read if they are compromised we need to encrypt them.

Both of these services provide native encryption functionality to ensure security of the sensitive documents. With EBS you can use KMS-managed or customer-managed encryption keys. With S3 you can use client-side or server-side encryption.

CORRECT: "Amazon S3 Server-Side Encryption" is a correct answer.

CORRECT: "Amazon EBS encryption with Customer Managed Keys" is also a correct answer.

INCORRECT: "AWS IAM Access Policy" is incorrect. IAM access policies can be used to control access but if the documents are somehow compromised they will not stop the documents from being read. For this we need encryption, and IAM access policies are not used for controlling encryption.

INCORRECT: "Amazon EBS snapshots" is incorrect. EBS snapshots are used for creating a point-in-time backup or data. They do maintain the encryption status of the data from the EBS volume but are not used for actually encrypting the data in the first place.

INCORRECT: "Amazon S3 cross region replication" is incorrect. S3 cross-region replication can be used for fault tolerance but does not apply any additional security to the data.

34. Question

A membership website has become quite popular and is gaining members quickly. The website currently runs on Amazon EC2 instances with one web server instance and one database instance running MySQL. A Solutions Architect is concerned about the lack of high-availability in the current architecture.

What can the Solutions Architect do to easily enable high availability without making major changes to the architecture?

1: Create a Read Replica in another availability zone

2: Enable Multi-AZ for the MySQL instance

3: Install MySQL on an EC2 instance in the same availability zone and enable replication

4: Install MySQL on an EC2 instance in another availability zone and enable replication

Answer: 4

Explanation:

If you are installing MySQL on an EC2 instance you cannot enable read replicas or multi-AZ. Instead you would need to use Amazon RDS with a MySQL DB engine to use these features.

In this example a good solution is to use the native HA features of MySQL. You would want to place the second MySQL DB instance in another AZ to enable high availability and fault tolerance.

Migrating to Amazon RDS may be a good solution but is not presented as an option.

CORRECT: "Install MySQL on an EC2 instance in another availability zone and enable replication" is the correct answer.

INCORRECT: "Create a Read Replica in another availability zone" is incorrect as described above.

INCORRECT: "Enable Multi-AZ for the MySQL instance" is incorrect as described above.

INCORRECT: "Install MySQL on an EC2 instance in the same availability zone and enable replication" is incorrect as described above.

35. Question

A Solutions Architect has setup a VPC with a public subnet and a VPN-only subnet. The public subnet is associated with a custom route table that has a route to an Internet Gateway. The VPN-only subnet is associated with the main route table and has a route to a virtual private gateway.

The Architect has created a new subnet in the VPC and launched an EC2 instance in it. However, the instance cannot connect to the Internet. What is the MOST likely reason?

1: The subnet has been automatically associated with the main route table which does not have a route to the Internet

2: The new subnet has not been associated with a route table

3: The Internet Gateway is experiencing connectivity problems

4: There is no NAT Gateway available in the new subnet so Internet connectivity is not possible

Answer: 1

Explanation:

When you create a new subnet, it is automatically associated with the main route table. Therefore, the EC2 instance will not have a route to the Internet. The Architect should associate the new subnet with the custom route table.

CORRECT: "The subnet has been automatically associated with the main route table which does not have a route to the Internet" is the correct answer.

INCORRECT: "The new subnet has not been associated with a route table" is incorrect. Subnets are always associated to a route table when created.

INCORRECT: "The Internet Gateway is experiencing connectivity problems" is incorrect. Internet Gateways are highly-available so it's unlikely that IGW connectivity is the issue.

INCORRECT: "There is no NAT Gateway available in the new subnet so Internet connectivity is not possible" is incorrect. NAT Gateways are used for connecting EC2 instances in private subnets to the Internet. This is a valid reason for a private subnet to not have connectivity, however in this case the Architect is attempting to use an Internet Gateway.

36. Question

A customer has a public-facing web application hosted on a single Amazon Elastic Compute Cloud (EC2) instance serving videos directly from an Amazon S3 bucket. Which of the following will restrict third parties from directly accessing the video assets in the bucket?

1: Launch the website Amazon EC2 instance using an IAM role that is authorized to access the videos

2: Restrict access to the bucket to the public CIDR range of the company locations

3: Use a bucket policy to only allow referrals from the main website URL

4: Use a bucket policy to only allow the public IP address of the Amazon EC2 instance hosting the customer website

Answer: 3

Explanation:

To allow read access to the S3 video assets from the public-facing web application, you can add a bucket policy that allows s3:GetObject permission with a condition, using the aws:referer key, that the get request must originate from specific webpages. This is a good answer as it fully satisfies the objective of ensuring the that EC2 instance can access the videos but direct access to the videos from other sources is prevented.

CORRECT: "Use a bucket policy to only allow referrals from the main website URL" is the correct answer.

INCORRECT: "Launch the website Amazon EC2 instance using an IAM role that is authorized to access the videos" is incorrect. Launching the EC2

instance with an IAM role that is authorized to access the videos is only half a solution as you would also need to create a bucket policy that specifies that the IAM role is granted access.

INCORRECT: "Restrict access to the bucket to the public CIDR range of the company locations" is incorrect. Restricting access to the bucket to the public CIDR range of the company locations will stop third-parties from accessing the bucket however it will also stop the EC2 instance from accessing the bucket and the question states that the EC2 instance is serving the files directly.

INCORRECT: "Use a bucket policy to only allow the public IP address of the Amazon EC2 instance hosting the customer website" is incorrect. You can use condition statements in a bucket policy to restrict access via IP address. However, using the referrer condition in a bucket policy is preferable as it is a best practice to use DNS names / URLs instead of hard-coding IPs whenever possible.

37. Question

A Solutions Architect is creating an AWS CloudFormation template that will provision a new EC2 instance and new EBS volume. What must be specified to associate the block store with the instance?

1: Both the EC2 physical ID and the EBS physical ID

2: The EC2 physical ID

3: Both the EC2 logical ID and the EBS logical ID

4: The EC2 logical ID

Answer: 3

Explanation:

The logical ID is used to reference the resource in parts of the template. For example, if you want to map an Amazon Elastic Block Store volume to an Amazon EC2 instance, you reference the logical IDs to associate the block stores with the instance.

In addition to the logical ID, certain resources also have a physical ID, which is the actual assigned name for that resource, such as an EC2 instance ID or an S3 bucket name. Use the physical IDs to identify resources outside of AWS CloudFormation templates, but only after the resources have been created.

Think of logical IDs as being used to reference resources within the template and Physical IDs being used to identify resources outside of AWS CloudFormation templates after they have been created.

CORRECT: "Both the EC2 logical ID and the EBS logical ID" is the correct answer.

INCORRECT: "Both the EC2 physical ID and the EBS physical ID" is incorrect as logical IDs can be used within the template.

INCORRECT: "The EC2 physical ID" is incorrect as logical IDs can be used.

INCORRECT: "The EC2 logical ID" is incorrect as the EBS logical ID should also be specified.

38. Question

An application stores encrypted data in Amazon S3 buckets. A Solutions Architect needs to be able to query the encrypted data using SQL queries and write the encrypted results back the S3 bucket. As the data is sensitive fine-grained control must be implemented over access to the S3 bucket.

What combination of services represent the BEST options support these requirements? (Select TWO)

1: Use AWS Glue to extract the data, analyze it, and load it back to the S3 bucket

2: Use bucket ACLs to restrict access to the bucket

3: Use IAM policies to restrict access to the bucket

4: Use Athena for querying the data and writing the results back to the bucket

5: Use the AWS KMS API to query the encrypted data, and the S3 API for writing the results

Answer: 3,4

Explanation:

Athena allows you to easily query encrypted data stored in Amazon S3 and write encrypted results back to your S3 bucket. Both, server-side encryption and client-side encryption are supported.

AWS IAM policies can be used to grant IAM users with fine-grained control to Amazon S3 buckets.

CORRECT: "Use IAM policies to restrict access to the bucket" is a correct answer.

CORRECT: "Use Athena for querying the data and writing the results back to the bucket" is also a correct answer.

INCORRECT: "Use AWS Glue to extract the data, analyze it, and load it back to the S3 bucket" is incorrect. AWS Glue is an ETL service and is not used for querying and analyzing data in S3.

INCORRECT: "Use bucket ACLs to restrict access to the bucket" is incorrect. With IAM policies, you can grant IAM users fine-grained control to your S3 buckets and is preferable to using bucket ACLs.

INCORRECT: "Use the AWS KMS API to query the encrypted data, and the S3 API for writing the results" is incorrect. The AWS KMS API can be used for encryption purposes; however it cannot perform analytics so is not suitable.

39. Question

A Solutions Architect works for a systems integrator running a platform that stores medical records. The government security policy mandates that patient data that contains personally identifiable information (PII) must be encrypted at all times, both at rest and in transit. Amazon S3 is used to back up data into the AWS cloud.

How can the Solutions Architect ensure the medical records are properly secured? (Select TWO)

1: Before uploading the data to S3 over HTTPS, encrypt the data locally using your own encryption keys

2: Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-128

3: Attach an encrypted EBS volume to an EC2 instance

4: Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-256

5: Upload the data using CloudFront with an EC2 origin

Answer: 1,4

Explanation:

When data is stored in an encrypted state it is referred to as encrypted “at rest” and when it is encrypted as it is being transferred over a network it is referred to as encrypted “in transit”. You can securely upload/download your data to Amazon S3 via SSL endpoints using the HTTPS protocol (In Transit – SSL/TLS).

You have the option of encrypting the data locally before it is uploaded or uploading using SSL/TLS so it is secure in transit and encrypting on the Amazon S3 side using S3 managed keys. The S3 managed keys will be AES-256 (not AES-128) bit keys

Uploading data using CloudFront with an EC2 origin or using an encrypted EBS volume attached to an EC2 instance is not a solution to this problem as your company wants to backup these records onto S3 (not EC2/EBS).

CORRECT: "Before uploading the data to S3 over HTTPS, encrypt the data locally using your own encryption keys" is a correct answer.

CORRECT: "Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-256" is also a correct answer.

INCORRECT: "Enable Server Side Encryption with S3 managed keys on an S3 bucket using AES-128" is incorrect as AES 256 should be used.

INCORRECT: "Attach an encrypted EBS volume to an EC2 instance" is incorrect as explained above.

INCORRECT: "Upload the data using CloudFront with an EC2 origin" is incorrect as explained above.

40. Question

A Solutions Architect is considering the best approach to enabling Internet access for EC2 instances in a private subnet. What advantages do NAT Gateways have over NAT Instances? (Select TWO)

1: Can be assigned to security groups

2: Can be used as a bastion host

3: Managed for you by AWS

4: Highly available within each AZ

5: Can be scaled up manually

Answer: 3,4

Explanation:

NAT gateways are managed for you by AWS. NAT gateways are highly available in each AZ into which they are deployed. They are not associated with any security groups and can scale automatically up to 45Gbps

NAT instances are managed by you. They must be scaled manually and do not provide HA. NAT Instances can be used as bastion hosts and can be assigned to security groups.

CORRECT: "Managed for you by AWS" is a correct answer.

CORRECT: "Highly available within each AZ" is also a correct answer.

INCORRECT: "Can be assigned to security groups" is incorrect as you cannot assign security groups to NAT gateways but you can to NAT instances.

INCORRECT: "Can be used as a bastion host" is incorrect, only a NAT instance can be used as a bastion host.

INCORRECT: "Can be scaled up manually" is incorrect, though automatic is better anyway!

41. Question

A Solutions Architect must design a solution for providing single sign-on to existing staff in a company. The staff manage on-premise web applications and also need access to the AWS management console to manage resources in the AWS cloud.

Which combination of services are BEST suited to delivering these requirements?

1: Use IAM and Amazon Cognito

2: Use your on-premise LDAP directory with IAM

3: Use the AWS Secure Token Service (STS) and SAML

4: Use IAM and MFA

Answer: 3

Explanation:

Single sign-on using federation allows users to login to the AWS console without assigning IAM credentials. The AWS Security Token Service (STS) is a web service that enables you to request temporary, limited-privilege credentials for IAM users or for users that you authenticate (such as federated users from an on-premise directory).

Federation (typically Active Directory) uses SAML 2.0 for authentication and grants temporary access based on the users AD credentials. The user does not need to be a user in IAM.

CORRECT: "Use the AWS Secure Token Service (STS) and SAML" is the correct answer.

INCORRECT: "Use IAM and Amazon Cognito" is incorrect. Amazon Cognito is used for authenticating users to web and mobile apps not for providing single sign-on between on-premises directories and the AWS management console.

INCORRECT: "Use your on-premise LDAP directory with IAM" is incorrect. You cannot use your on-premise LDAP directory with IAM, you must use federation.

INCORRECT: "Use IAM and MFA" is incorrect. Enabling multi-factor authentication (MFA) for IAM is not a federation solution..

42. Question

A Solutions Architect is designing a three-tier web application that includes an Auto Scaling group of Amazon EC2 Instances running behind an Elastic Load Balancer. The security team requires that all web servers must be accessible only through the Elastic Load Balancer and that none of the web servers are directly accessible from the Internet.

How should the Architect meet these requirements?

1: Create an Amazon CloudFront distribution in front of the Elastic Load Balancer

2: Configure the web servers' security group to deny traffic from the Internet

3: Configure the web tier security group to allow only traffic from the Elastic Load Balancer

4: Install a Load Balancer on an Amazon EC2 instance

Answer: 3

Explanation:

The web servers must be kept private so they will be not have public IP addresses. The ELB is Internet-facing so it will be publicly accessible via it’s DNS address (and corresponding public IP).

To restrict web servers to be accessible only through the ELB you can configure the web tier security group to allow only traffic from the ELB. You would normally do this by adding the ELBs security group to the rule on the web tier security group

CORRECT: "Configure the web tier security group to allow only traffic from the Elastic Load Balancer" is the correct answer.

INCORRECT: "Create an Amazon CloudFront distribution in front of the Elastic Load Balancer" is incorrect. CloudFront distributions are used for caching content to improve performance for users on the Internet. They are not security devices to be used for restricting access to EC2 instances.

INCORRECT: "Configure the web servers' security group to deny traffic from the Internet" is incorrect. You cannot create deny rules in security groups.

INCORRECT: "Install a Load Balancer on an Amazon EC2 instance" is incorrect. This scenario is using an Elastic Load Balancer and these cannot be installed on EC2 instances (at least not by you, in reality all ELBs are actually running on EC2 instances but these are transparent to the AWS end user).

43. Question

A Solutions Architect is creating a URL that lets users who sign in to the organization's network securely access the AWS Management Console. The URL will include a sign-in token that authenticates the user to AWS. Microsoft Active Directory Federation Services is being used as the identity provider (IdP).

Which of the steps below will the Solutions Architect need to include when developing the custom identity broker? (Select TWO)

1: Call the AWS federation endpoint and supply the temporary security credentials to request a sign-in token

2: Call the AWS Security Token Service (AWS STS) AssumeRole or GetFederationToken API operations to obtain temporary security credentials for the user

3: Assume an IAM Role through the console or programmatically with the AWS CLI, Tools for Windows PowerShell or API

4: Generate a pre-signed URL programmatically using the AWS SDK for Java or the AWS SDK for .NET

5: Delegate access to the IdP through the "Configure Provider" wizard in the IAM console

Answer: 1,2

Explanation:

The aim of this solution is to create a single sign-on solution that enables users signed in to the organization's Active Directory service to be able to connect to AWS resources. When developing a custom identity broker you use the AWS STS service.

The AWS Security Token Service (STS) is a web service that enables you to request temporary, limited-privilege credentials for IAM users or for users that you authenticate (federated users). The steps performed by the custom identity broker to sign users into the AWS management console are:

- Verify that the user is authenticated by your local identity system
- Call the AWS Security Token Service (AWS STS) AssumeRole or GetFederationToken API operations to obtain temporary security credentials for the user
- Call the AWS federation endpoint and supply the temporary security credentials to request a sign-in token
- Construct a URL for the console that includes the token
- Give the URL to the user or invoke the URL on the user's behalf

CORRECT: "Call the AWS federation endpoint and supply the temporary security credentials to request a sign-in token" is the correct answer.

CORRECT: "Call the AWS Security Token Service (AWS STS) AssumeRole or GetFederationToken API operations to obtain temporary security credentials for the user" is the correct answer.

INCORRECT: "Assume an IAM Role through the console or programmatically with the AWS CLI, Tools for Windows PowerShell or API" is incorrect as this is an example of federation so assuming a role is the wrong procedure.

INCORRECT: "Generate a pre-signed URL programmatically using the AWS SDK for Java or the AWS SDK for .NET" is incorrect. You cannot generate a pre-signed URL for this purpose using SDKs, delegate access through the IAM console or directly assume IAM roles.

INCORRECT: "Delegate access to the IdP through the "Configure Provider" wizard in the IAM console" is incorrect as this is not something

you can do

44. Question

Some Amazon ECS containers are running on a cluster using the EC2 launch type. The current configuration uses the container instance's IAM roles for assigning permissions to the containerized applications.

A Solutions Architect needs to implement more granular permissions so that some applications can be assigned more restrictive permissions.

How can this be achieved?

1: This cannot be changed as IAM roles can only be linked to container instances

2: This can be achieved using IAM roles for tasks, and splitting the containers according to the permissions required to different task definition profiles

3: This can be achieved by configuring a resource-based policy for each application

4: This can only be achieved using the Fargate launch type

Answer: 2

Explanation:

With IAM roles for Amazon ECS tasks, you can specify an IAM role that can be used by the containers in a task. Using this feature, you can achieve the required outcome by using IAM roles for tasks and splitting the containers according to the permissions required to different task profiles.

CORRECT: "This can be achieved using IAM roles for tasks, and splitting the containers according to the permissions required to different task definition profiles" is the correct answer.

INCORRECT: "This cannot be changed as IAM roles can only be linked to container instances" is incorrect as you can also link them to tasks.

INCORRECT: "This can be achieved by configuring a resource-based policy for each application" is incorrect. Amazon ECS does not support IAM resource-based policies.

INCORRECT: "This can only be achieved using the Fargate launch type" is incorrect. The solution can be achieved whether using the EC2 or Fargate launch types.

45. Question

An application uses a combination of Reserved and On-Demand instances to handle typical load. The application involves performing analytics on a set of data. A Solutions Architect needs to temporarily deploy a large number of EC2 instances. The instances must be available for a short period of time until the analytics job is completed. If job completion is not time-critical, what is likely to be the MOST cost-effective choice of EC2 instance type to use for this requirement?

1: Use Spot instances

2: Use dedicated hosts

3: Use On-Demand instances

4: Use Reserved instances

Answer: 1

Explanation:

The key requirements here are that you need to temporarily deploy a large number of instances, can tolerate an delay (not time-critical), and need the most economical solution. In this case Spot instances are likely to be the most economical solution.

You must be able to tolerate delays if using Spot instances as if the market price increases your instances will be terminated and you may have to wait for the price to lower back to your budgeted allowance.

CORRECT: "Use Spot instances" is the correct answer.

INCORRECT: "Use dedicated hosts" is incorrect. An EC2 Dedicated Host is a physical server with EC2 instance capacity fully dedicated to your use. They are much more expensive than on-demand or Spot instances and are used for use cases such as bringing your own socket-based software licences to AWS or for compliance reasons.

INCORRECT: "Use On-Demand instances" is incorrect. On-demand is good for temporary deployments when you cannot tolerate any delays (instances being terminated by AWS). It is likely to be more expensive than Spot however so if delays can be tolerated it is not the best solution.

INCORRECT: "Use Reserved instances" is incorrect. Reserved instances are used for longer more stable requirements where you can get a discount for a fixed 1 or 3 year term. This pricing model is not good for temporary requirements.

46. Question

There is a problem with an EC2 instance that was launched by Amazon EC2 Auto Scaling. The EC2 status checks have reported that the instance is “Impaired”. What action will EC2 Auto Scaling take?

1: Auto Scaling will perform Availability Zone rebalancing

2: It will wait a few minutes for the instance to recover and if it does not it will mark the instance for termination, terminate it, and then launch a replacement

3: Auto Scaling performs its own status checks and does not integrate with EC2 status checks

4: It will launch a new instance immediately and then mark the impaired one for replacement

Answer: 2

Explanation:

If any health check returns an unhealthy status the instance will be terminated. For the “impaired” status, the ASG will wait a few minutes to see if the instance recovers before taking action. If the “impaired” status persists, termination occurs. Unlike AZ rebalancing, termination of unhealthy instances happens first, then Auto Scaling attempts to launch new instances to replace terminated instances.

CORRECT: "It will wait a few minutes for the instance to recover and if it does not it will mark the instance for termination, terminate it, and then launch a replacement" is the correct answer.

INCORRECT: "Auto Scaling will perform Availability Zone rebalancing" is incorrect. Auto Scaling will not perform Availability Zone rebalancing due to an impaired status check.

INCORRECT: "Auto Scaling performs its own status checks and does not integrate with EC2 status checks" is incorrect. Auto Scaling does integrate with EC2 status checks as well as having its own status checks.

INCORRECT: "It will launch a new instance immediately and then mark the impaired one for replacement" is incorrect. Auto Scaling will not launch a new instance immediately as it always terminates unhealthy instance before launching a replacement.

47. Question

A pharmaceutical company uses a strict process for release automation that involves building and testing services in 3 separate VPCs. A peering topology is configured with VPC-A peered with VPC-B and VPC-B peered with VPC-C. The development team wants to modify the process so that they can release code directly from VPC-A to VPC-C.

How can this be accomplished?

1: Update VPC-Bs route table with peering targets for VPC-A and VPC-C and enable route propagation

2: Create a new VPC peering connection between VPC-A and VPC-C

3: Update the CIDR blocks to match to enable inter-VPC routing

4: Update VPC-As route table with an entry using the VPC peering as a target

Answer: 2

Explanation:

A VPC peering connection is a networking connection between two VPCs that enables you to route traffic between them using private IPv4 addresses or IPv6 addresses. Instances in either VPC can communicate with each other as if they are within the same network.

You can create a VPC peering connection between your own VPCs, or with a VPC in another AWS account. The VPCs can be in different regions (also known as an inter-region VPC peering connection).

It is not possible to use transitive peering relationships with VPC peering and therefore you must create an additional VPC peering connection between VPC-A and VPC-C.

CORRECT: "Create a new VPC peering connection between VPC-A and VPC-C" is the correct answer.

INCORRECT: "Update VPC-Bs route table with peering targets for VPC-A and VPC-C and enable route propagation" is incorrect. Route propagation cannot be used to extend VPC peering connections.

INCORRECT: "Update the CIDR blocks to match to enable inter-VPC routing" is incorrect. You cannot have matching (overlapping) CIDR blocks with VPC peering.

INCORRECT: "Update VPC-As route table with an entry using the VPC peering as a target" is incorrect. You must update route tables to configure

routing however updating VPC-As route table alone will not lead to the desired result without first creating the additional peering connection.

48. Question

A Solutions Architect needs to work programmatically with IAM. Which feature of IAM allows direct access to the IAM web service using HTTPS to call service actions and what is the method of authentication that must be used? (Select TWO)

1: OpenID Connect
2: Query API
3: API Gateway
4: Access key ID and secret access key
5: IAM role

Answer: 2,4

Explanation:

AWS recommend that you use the AWS SDKs to make programmatic API calls to IAM. However, you can also use the IAM Query API to make direct calls to the IAM web service. An access key ID and secret access key must be used for authentication when using the Query API.

CORRECT: "Query API" is a correct answer.

CORRECT: "Access key ID and secret access key" is also a correct answer.

INCORRECT: "OpenID Connect" is incorrect. OpenID Connect is a provider for connecting external directories.

INCORRECT: "API Gateway" is incorrect. API gateway is a separate service for accepting and processing API calls.

INCORRECT: "IAM role" is incorrect. An IAM role is not used for authentication to the Query API.

49. Question

The Systems Administrators in a company currently use Chef for configuration management of on-premise servers. Which AWS service can a Solutions Architect use that will provide a fully-managed configuration management service that will enable the use of existing Chef cookbooks?

1: Elastic Beanstalk
2: CloudFormation
3: OpsWorks for Chef Automate
4: Opsworks Stacks

Answer: 3

Explanation:

AWS OpsWorks is a configuration management service that provides managed instances of Chef and Puppet. AWS OpsWorks for Chef Automate is a fully-managed configuration management service that hosts Chef Automate, a suite of automation tools from Chef for configuration management, compliance and security, and continuous deployment. OpsWorks for Chef Automate is completely compatible with tooling and cookbooks from the Chef community and automatically registers new nodes with your Chef server.

CORRECT: "OpsWorks for Chef Automate" is the correct answer.

INCORRECT: "Opsworks Stacks" is incorrect. AWS OpsWorks Stacks lets you manage applications and servers on AWS and on-premises and uses Chef Solo. The question does not require the managed solution on AWS to manage on-premises resources, just to use existing cookbooks so this is not the preferred solution.

INCORRECT: "Elastic Beanstalk" is incorrect. AWS Elastic Beanstalk is not able to build infrastructure using Chef cookbooks.

INCORRECT: "CloudFormation" is incorrect. AWS CloudFormation is not able to build infrastructure using Chef cookbooks.

50. Question

An Amazon RDS Multi-AZ deployment is running in an Amazon VPC. An outage occurs in the availability zone of the primary RDS database instance. What actions will take place in this circumstance? (Select TWO)

1: The failover mechanism automatically changes the DNS record of the DB instance to point to the standby DB instance
2: A failover will take place once the connection draining timer has expired
3: A manual failover of the DB instance will need to be initiated using Reboot with failover

4: The primary DB instance will switch over automatically to the standby replica

5: Due to the loss of network connectivity the process to switch to the standby replica cannot take place

Answer: 1,4

Explanation:

Multi-AZ RDS creates a replica in another AZ and synchronously replicates to it (DR only).

A failover may be triggered in the following circumstances:

- Loss of primary AZ or primary DB instance failure
- Loss of network connectivity on primary
- Compute (EC2) unit failure on primary
- Storage (EBS) unit failure on primary
- The primary DB instance is changed
- Patching of the OS on the primary DB instance
- Manual failover (reboot with failover selected on primary)

During failover RDS automatically updates configuration (including DNS endpoint) to use the second node.

CORRECT: "The failover mechanism automatically changes the DNS record of the DB instance to point to the standby DB instance" is a correct answer.

CORRECT: "The primary DB instance will switch over automatically to the standby replica" is also a correct answer.

INCORRECT: "A failover will take place once the connection draining timer has expired" is incorrect. Connection draining timers are applicable to ELBs not RDS.

INCORRECT: "A manual failover of the DB instance will need to be initiated using Reboot with failover" is incorrect. You do not need to manually failover the DB instance, multi-AZ has an automatic process as outlined above.

INCORRECT: "Due to the loss of network connectivity the process to switch to the standby replica cannot take place" is incorrect. The process to failover is not reliant on network connectivity as it is designed for fault tolerance.

51. Question

A Solutions Architect is designing a web-facing application. The application will run on Amazon EC2 instances behind Elastic Load Balancers in multiple regions in an active/passive configuration. The website address the application runs on is example.com. AWS Route 53 will be used to perform DNS resolution for the application.

How should the Solutions Architect configure AWS Route 53 in this scenario based on AWS best practices? (Select TWO)

1: Use a Failover Routing Policy

2: Set Evaluate Target Health to “No” for the primary

3: Use a Weighted Routing Policy

4: Connect the ELBs using Alias records

5: Connect the ELBs using CNAME records

Answer: 1,4

Explanation:

The failover routing policy is used for active/passive configurations. Alias records can be used to map the domain apex (example.com) to the Elastic Load Balancers.

Failover routing lets you route traffic to a resource when the resource is healthy or to a different resource when the first resource is unhealthy. The primary and secondary records can route traffic to anything from an Amazon S3 bucket that is configured as a website to a complex tree of records.

CORRECT: "Use a Failover Routing Policy" is a correct answer.

CORRECT: "Connect the ELBs using Alias records" is also a correct answer.

INCORRECT: "Set Evaluate Target Health to “No” for the primary" is incorrect. For Evaluate Target Health choose Yes for your primary record and choose No for your secondary record. For your primary record choose Yes for Associate with Health Check. Then for Health Check to Associate select the health check that you created for your primary resource.

INCORRECT: "Use a Weighted Routing Policy" is incorrect. Weighted routing is not an active/passive routing policy. All records are active and the traffic is distributed according to the weighting.

INCORRECT: "Connect the ELBs using CNAME records" is incorrect. You cannot use CNAME records for the domain apex record, you must use Alias records.

52. Question

A Solutions Architect is designing a new retail website for a high-profile company. The company has previously been the victim of targeted distributed denial-of-service (DDoS) attacks and has requested that the design includes mitigation techniques.

Which of the following are the BEST techniques to help ensure the availability of the services is not compromised in an attack? (Select TWO)

1: Configure Auto Scaling with a high maximum number of instances to ensure it can scale accordingly

2: Use CloudFront for distributing both static and dynamic content

3: Use Spot instances to reduce the cost impact in case of attack

4: Use encryption on your EBS volumes

5: Use Placement Groups to ensure high bandwidth and low latency

Answer: 1,2

Explanation:

CloudFront distributes traffic across multiple edge locations and filters requests to ensure that only valid HTTP(S) requests will be forwarded to backend hosts. CloudFront also supports geoblocking, which you can use to prevent requests from particular geographic locations from being served.

Auto Scaling helps to maintain a desired count of EC2 instances running at all times and setting a high maximum number of instances allows your fleet to grow and absorb some of the impact of the attack.

CORRECT: "Configure Auto Scaling with a high maximum number of instances to ensure it can scale accordingly" is a correct answer.

CORRECT: "Use CloudFront for distributing both static and dynamic content" is also a correct answer.

INCORRECT: "Use Spot instances to reduce the cost impact in case of attack" is incorrect. Spot instances may reduce the cost (depending on the current Spot price) however the questions asks us to focus on availability not cost.

INCORRECT: "Use encryption on your EBS volumes" is incorrect. Encrypting EBS volumes does not help in a DDoS attack as the attack is targeted at reducing availability rather than compromising data.

INCORRECT: "Use Placement Groups to ensure high bandwidth and low latency" is incorrect as this will not assist with mitigation of DDoS attacks.

53. Question

An application running on Amazon EC2 requires an EBS volume for saving structured data. The application vendor suggests that the performance of the disk should be up to 3 IOPS per GB. The capacity is expected to grow to 2 TB.

Taking into account cost effectiveness, which EBS volume type should be used?

1: Throughput Optimized HDD (ST1)

2: General Purpose (GP2)

3: Provisioned IOPS (Io1)

4: Cold HDD (SC1)

Answer: 2

Explanation:

SSD, General Purpose (GP2) provides enough IOPS to support this requirement and is the most economical option that does. Using Provisioned IOPS would be more expensive and the other two options do not provide an SLA for IOPS.

More information on the volume types:

- SSD, General Purpose (GP2) provides 3 IOPS per GB up to 16,000 IOPS. Volume size is 1 GB to 16 TB.
- Provisioned IOPS (Io1) provides the IOPS you assign up to 50 IOPS per GiB and up to 64,000 IOPS per volume. Volume size is 4 GB to 16TB.
- Throughput Optimized HDD (ST1) provides up to 500 IOPS per volume but does not provide an SLA for IOPS.
- Cold HDD (SC1) provides up to 250 IOPS per volume but does not provide an SLA for IOPS.

CORRECT: "General Purpose (GP2)" is the correct answer.

INCORRECT: "Throughput Optimized HDD (ST1)" is incorrect as this will not provide an SLA for IOPS.

INCORRECT: "Provisioned IOPS (Io1)" is incorrect as this will be less cost-effective.

INCORRECT: "Cold HDD (SC1)" is incorrect as this will not provide an SLA for IOPS.

54. Question

An application in an Amazon VPC uses an Auto Scaling Group that spans 3 AZs and there are currently 4 Amazon EC2 instances running in the group. What actions will Auto Scaling take, by default, if it needs to terminate an EC2 instance?

1: Randomly select one of the 3 AZs, and then terminate an instance in that AZ

2: Terminate the instance with the least active network connections. If multiple instances meet this criterion, one will be randomly selected

3: Send an SNS notification, if configured to do so

4: Wait for the cooldown period and then terminate the instance that has been running the longest

5: Terminate an instance in the AZ which currently has 2 running EC2 instances

Answer: 3,5

Explanation:

Auto Scaling can perform rebalancing when it finds that the number of instances across AZs is not balanced. Auto Scaling rebalances by launching new EC2 instances in the AZs that have fewer instances first, only then will it start terminating instances in AZs that had more instances

Auto Scaling can be configured to send an SNS email when:

- An instance is launched.
- An instance is terminated.
- An instance fails to launch.
- An instance fails to terminate.

CORRECT: "Send an SNS notification, if configured to do so" is a correct answer.

CORRECT: "Terminate an instance in the AZ which currently has 2 running EC2 instances" is also a correct answer.

INCORRECT: "Terminate the instance with the least active network connections. If multiple instances meet this criterion, one will be randomly selected" is incorrect. Auto Scaling will only terminate an instance randomly after it has first gone through several other selection steps. Please see the AWS article below for detailed information on the process

INCORRECT: "Wait for the cooldown period and then terminate the instance that has been running the longest" is incorrect. Auto Scaling does not terminate the instance that has been running the longest.

INCORRECT: "Terminate an instance in the AZ which currently has 2 running EC2 instances" is incorrect as it will launch instances in that AZ before terminating.

55. Question

Several environments are being created in a single Amazon VPC. The Solutions Architect needs to implement a system of categorization that allows for identification of Amazon EC2 resources by business unit, owner, or environment.

Which AWS feature can be used?

1: Parameters

2: Metadata

3: Custom filters

4: Tags

Answer: 4

Explanation:

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value, both of which you define. Tags enable you to categorize your AWS resources in different ways, for example, by purpose, owner, or environment.

CORRECT: "Tags" is the correct answer.

INCORRECT: "Parameters" is incorrect. Parameters are not used for categorization

INCORRECT: "Metadata" is incorrect. Instance metadata is data about your instance that you can use to configure or manage the running instance.

INCORRECT: "Custom filters" is incorrect. Custom filters are not used for categorization.

56. Question

An organization has a data lake on Amazon S3 and needs to find a solution for performing in-place queries of the data assets in the data lake. The requirement is to perform both data discovery and SQL querying, and complex queries from a large number of concurrent users using BI tools.

What is the BEST combination of AWS services to use in this situation? (Select TWO)

1: RedShift Spectrum for the complex queries

2: Amazon Athena for the ad hoc SQL querying

3: AWS Glue for the ad hoc SQL querying

4: AWS Lambda for the complex queries

5: Amazon Kinesis for the complex queries

Answer: 1,2

Explanation:

Performing in-place queries on a data lake allows you to run sophisticated analytics queries directly on the data in S3 without having to load it into a data warehouse.

You can use both Athena and Redshift Spectrum against the same data assets. You would typically use Athena for ad hoc data discovery and SQL querying, and then use Redshift Spectrum for more complex queries and scenarios where a large number of data lake users want to run concurrent BI and reporting workloads.

CORRECT: "RedShift Spectrum for the complex queries" is a correct answer.

CORRECT: "Amazon Athena for the ad hoc SQL querying" is also a correct answer.

INCORRECT: "AWS Glue for the ad hoc SQL querying" is incorrect. AWS Glue is an extract, transform and load (ETL) service.

INCORRECT: "AWS Lambda for the complex queries" is incorrect. AWS Lambda is a serverless technology for running functions, it is not the best

solution for running analytics queries.

INCORRECT: "Amazon Kinesis for the complex queries" is incorrect. Amazon Kinesis is used for ingesting and processing real time streaming data, not performing queries.

57. Question

When using throttling controls with API Gateway what happens when request submissions exceed the steady-state request rate and burst limits?

1: API Gateway fails the limit-exceeding requests and returns “429 Too Many Requests” error responses to the client

2: The requests will be buffered in a cache until the load reduces

3: API Gateway drops the requests and does not return a response to the client

4: API Gateway fails the limit-exceeding requests and returns “500 Internal Server Error” error responses to the client

Answer: 1

Explanation:

You can throttle and monitor requests to protect your backend. Resiliency through throttling rules based on the number of requests per second for each HTTP method (GET, PUT). Throttling can be configured at multiple levels including Global and Service Call.

When request submissions exceed the steady-state request rate and burst limits, API Gateway fails the limit-exceeding requests and returns 429 Too Many Requests error responses to the client.

CORRECT: "API Gateway fails the limit-exceeding requests and returns “429 Too Many Requests” error responses to the client" is the correct answer.

INCORRECT: "The requests will be buffered in a cache until the load reduces" is incorrect as the requests are actually failed.

INCORRECT: "API Gateway drops the requests and does not return a response to the client" is incorrect as it does return a response as detailed above.

INCORRECT: "API Gateway fails the limit-exceeding requests and returns “500 Internal Server Error” error responses to the client" is incorrect as a

429 error is returned.

58. Question

A Solutions Architect created a new VPC and setup an Auto Scaling Group to maintain a desired count of 2 Amazon EC2 instances. The security team has requested that the EC2 instances be located in a private subnet. To distribute load, an Internet-facing Application Load Balancer (ALB) is also required.

With the security team's requirements in mind, what else needs to be done to get this configuration to work? (Select TWO)

1: Attach an Internet Gateway to the private subnets

2: Associate the public subnets with the ALB

3: Add an Elastic IP address to each EC2 instance in the private subnet

4: Add a NAT gateway to the private subnet

5: For each private subnet create a corresponding public subnet in the same AZ

Answer: 2,5

Explanation:

ELB nodes have public IPs and route traffic to the private IP addresses of the EC2 instances. You need one public subnet in each AZ where the ELB is defined and the private subnets are located

CORRECT: "Associate the public subnets with the ALB" is a correct answer.

CORRECT: "For each private subnet create a corresponding public subnet in the same AZ" is also a correct answer.

INCORRECT: "Attach an Internet Gateway to the private subnets" is incorrect. Attaching an Internet gateway (which is done at the VPC level, not the subnet level) or a NAT gateway will not assist as these are both used for outbound communications which is not the goal here.

INCORRECT: "Add an Elastic IP address to each EC2 instance in the private subnet" is incorrect. ELBs talk to the private IP addresses of the EC2 instances so adding an Elastic IP address to the instance won't help. Additionally, Elastic IP addresses are used in public subnets to allow Internet access via an Internet Gateway.

INCORRECT: "Add a NAT gateway to the private subnet" is incorrect as this would only enable outbound internet access.

59. Question

An application running AWS uses an Elastic Load Balancer (ELB) to distribute connections between EC2 instances. A Solutions Architect needs to record information on the requester, IP, and request type for connections made to the ELB. Additionally, the Architect will also need to perform some analysis on the log files.

Which AWS services and configuration options can be used to collect and then analyze the logs? (Select TWO)

1: Use EMR for analyzing the log files

2: Update the application to use DynamoDB for storing log files

3: Use Elastic Transcoder to analyze the log files

4: Enable Access Logs on the ELB and store the log files on S3

5: Enable Access Logs on the EC2 instances and store the log files on S3

Answer: 1,4

Explanation:

The best way to deliver these requirements is to enable access logs on the ELB and then use EMR for analyzing the log files

Access Logs on ELB are disabled by default. Information includes information about the clients (not included in CloudWatch metrics) such as the identity of the requester, IP, request type etc. Logs can be optionally stored and retained in S3

Amazon EMR is a web service that enables businesses, researchers, data analysts, and developers to easily and cost-effectively process vast amounts of data. EMR utilizes a hosted Hadoop framework running on Amazon EC2 and Amazon S3.

CORRECT: "Use EMR for analyzing the log files" is the correct answer.

CORRECT: "Enable Access Logs on the ELB and store the log files on S3" is the correct answer.

INCORRECT: "Update the application to use DynamoDB for storing log files" is incorrect. The information recorded by ELB access logs is exactly

what you require so there is no need to get the application to record the information into DynamoDB.

INCORRECT: "Use Elastic Transcoder to analyze the log files" is incorrect. Elastic Transcoder is used for converting media file formats not analyzing files.

INCORRECT: "Enable Access Logs on the EC2 instances and store the log files on S3" is incorrect as the access logs on the ELB should be enabled.

60. Question

A Solutions Architect would like to store a backup of an Amazon EBS volume on Amazon S3. What is the easiest way of achieving this?

1: Use SWF to automatically create a backup of your EBS volumes and then upload them to an S3 bucket

2: You don't need to do anything, EBS volumes are automatically backed up by default

3: Write a custom script to automatically copy your data to an S3 bucket

4: Create a snapshot of the volume

Answer: 4

Explanation:

Snapshots capture a point-in-time state of an instance. Snapshots of Amazon EBS volumes are stored on S3 by design so you only need to take a snapshot and it will automatically be stored on Amazon S3.

CORRECT: "Create a snapshot of the volume" is the correct answer.

INCORRECT: "Use SWF to automatically create a backup of your EBS volumes and then upload them to an S3 bucket" is incorrect. This is not a good use case for Amazon SWF.

INCORRECT: "You don't need to do anything, EBS volumes are automatically backed up by default" is incorrect. Amazon EBS volumes are not automatically backed up using snapshots. You need to manually take a snapshot or you can use Amazon Data Lifecycle Manager (Amazon DLM) to automate the creation, retention, and deletion of snapshots.

INCORRECT: "Write a custom script to automatically copy your data to an S3 bucket" is incorrect as this is not the simplest solution available.

61. Question

An application will gather data from a website hosted on an EC2 instance and write the data to an S3 bucket. The application will use API calls to interact with the EC2 instance and S3 bucket.

Which Amazon S3 access control method will be the MOST operationally efficient? (Select TWO)

1: Create a bucket policy

2: Grant programmatic access

3: Use key pairs

4: Grant AWS Management Console access

5: Create an IAM policy

Answer: 2,5

Explanation:

Policies are documents that define permissions and can be applied to users, groups and roles. Policy documents are written in JSON (key value pair that consists of an attribute and a value).

Within an IAM policy you can grant either programmatic access or AWS Management Console access to Amazon S3 resources.

CORRECT: "Grant programmatic access" is a correct answer.

CORRECT: "Create an IAM policy" is also a correct answer.

INCORRECT: "Create a bucket policy" is incorrect as it is more efficient to use an IAM policy.

INCORRECT: "Use key pairs" is incorrect. Key pairs are used for access to EC2 instances; a bucket policy would not assist with access control with EC2 and granting management console access will not assist the application which is making API calls to the services.

INCORRECT: "Grant AWS Management Console access" is incorrect as programmatic access is required.

62. Question

An Amazon CloudWatch alarm recently notified a Solutions Architect that the load on an Amazon DynamoDB table is getting close to the provisioned capacity for writes. The DynamoDB table is part of a two-

tier customer-facing application and is configured using provisioned capacity.

What will happen if the limit for the provisioned capacity for writes is reached?

1: The requests will be throttled, and fail with an HTTP 503 code (Service Unavailable)

2: DynamoDB scales automatically so there's no need to worry

3: The requests will be throttled, and fail with an HTTP 400 code (Bad Request) and a ProvisionedThroughputExceededException

4: The requests will succeed, and an HTTP 200 status code will be returned

Answer: 3

Explanation:

Amazon DynamoDB can throttle requests that exceed the provisioned throughput for a table. When a request is throttled it fails with an HTTP 400 code (Bad Request) and a ProvisionedThroughputExceeded exception (not a 503 or 200 status code).

When using the provisioned capacity pricing model DynamoDB does not automatically scale. DynamoDB can automatically scale when using the new on-demand capacity mode, however this is not configured for this database.

CORRECT: "The requests will be throttled, and fail with an HTTP 400 code (Bad Request) and a ProvisionedThroughputExceededException" is the correct answer.

INCORRECT: "The requests will be throttled, and fail with an HTTP 503 code (Service Unavailable)" is incorrect as this is not the code that is used (see above).

INCORRECT: "DynamoDB scales automatically so there's no need to worry" is incorrect as provisioned capacity mode does not automatically scale.

INCORRECT: "The requests will succeed, and an HTTP 200 status code will be returned" is incorrect as the request will fail as described above.

63. Question

A Solutions Architect is creating the business process workflows associated with an order fulfilment system. What AWS service can assist with coordinating tasks across distributed application components?

1: AWS STS
2: Amazon SQS
3: Amazon SWF
4: Amazon SNS

Answer: 3

Explanation:

Amazon Simple Workflow Service (SWF) is a web service that makes it easy to coordinate work across distributed application components. SWF enables applications for a range of use cases, including media processing, web application back-ends, business process workflows, and analytics pipelines, to be designed as a coordination of tasks.

CORRECT: "Amazon SWF" is the correct answer.

INCORRECT: "AWS STS" is incorrect. AWS Security Token Service (STS) is used for requesting temporary credentials.

INCORRECT: "Amazon SQS" is incorrect. Amazon Simple Queue Service (SQS) is a message queue used for decoupling application components.

INCORRECT: "Amazon SNS" is incorrect. Amazon Simple Notification Service (SNS) is a web service that makes it easy to set up, operate, and send notifications from the cloud. SNS supports notifications over multiple transports including HTTP/HTTPS, Email/Email-JSON, SQS and SMS.

64. Question

An EC2 instance in an Auto Scaling group is having some issues that are causing it to launch new instances based on the dynamic scaling policy. A Solutions Architect needs to troubleshoot the EC2 instance and prevent the Auto Scaling group from launching new instances temporarily.

What is the best method to accomplish this? (Select TWO)

1: Remove the EC2 instance from the Target Group
2: Disable the launch configuration associated with the EC2 instance
3: Place the EC2 instance that is experiencing issues into the Standby state
4: Suspend the scaling processes responsible for launching new instances
5: Disable the dynamic scaling policy

Answer: 3,4

Explanation:

You can suspend and then resume one or more of the scaling processes for your Auto Scaling group. This can be useful when you want to investigate a configuration problem or other issue with your web application and then make changes to your application, without invoking the scaling processes. You can manually move an instance from an ASG and put it in the standby state

Instances in standby state are still managed by Auto Scaling, are charged as normal, and do not count towards available EC2 instance for workload/application use. Auto scaling does not perform health checks on instances in the standby state. Standby state can be used for performing updates/changes/troubleshooting etc. without health checks being performed or replacement instances being launched.

CORRECT: "Place the EC2 instance that is experiencing issues into the Standby state" is a correct answer.

CORRECT: "Suspend the scaling processes responsible for launching new instances" is also a correct answer.

INCORRECT: "Remove the EC2 instance from the Target Group" is incorrect. Target Groups are features of ELB (specifically ALB/NLB). Removing the instance from the target group will stop the ELB from sending connections to it but will not stop Auto Scaling from launching new instances while you are troubleshooting it.

INCORRECT: "Disable the launch configuration associated with the EC2 instance" is incorrect. You cannot disable the launch configuration and you can’t modify a launch configuration after you’ve created it.

INCORRECT: "Disable the dynamic scaling policy" is incorrect. You do not need to disable the dynamic scaling policy; you can just suspend it as previously described.

65. Question

An Amazon VPC has been deployed with private and public subnets. A MySQL database server running on an Amazon EC2 instance will soon be launched. According to AWS best practice, which subnet should the database server be launched into?

1: It doesn’t matter

2: The private subnet
3: The public subnet
4: The subnet that is mapped to the primary AZ in the region

Answer: 2

Explanation:

AWS best practice is to deploy databases into private subnets wherever possible. You can then deploy your web front-ends into public subnets and configure these, or an additional application tier to write data to the database.

CORRECT: "The private subnet" is the correct answer.

INCORRECT: "It doesn't matter" is incorrect as the best practice does recommend using a private subnet.

INCORRECT: "The public subnet" is incorrect. Public subnets are typically used for web front-ends as they are directly accessible from the Internet. It is preferable to launch your database in a private subnet.

INCORRECT: "The subnet that is mapped to the primary AZ in the region" is incorrect. There is no such thing as a "primary" Availability Zone (AZ). All AZs are essentially created equal and your subnets map 1:1 to a single AZ.

SET 5: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 5: Practice Questions, Answers & Explanations

1. Question

A Solutions Architect has deployed an API using Amazon API Gateway and created usage plans and API keys for several customers. Requests from one particular customer have been excessive and the solutions architect needs to limit the rate of requests. Other customers should not be affected. How should the solutions architect proceed?

1: Configure a server-side throttling limit

2: Configure the per-method throttling limits

3: Configure per-client throttling limits

4: Configure the account-level throttling limits

2. Question

A Solutions Architect is deploying a high performance computing (HPC) application on Amazon EC2 instances. The application requires extremely low inter-instance latency. How should the instances be deployed for BEST performance?

1: Use an instance with enhanced networking and deploy the instances in a partition placement group

2: Use an Elastic Fabric Adapter (EFA) and deploy instances in a cluster placement group

3: Add multiple Elastic Network Adapters (ENAs) to each instance and create a NIC team

4: Use an EBS-optimized instance with 10 Gigabit networking and deploy to a single subnet

3. Question

A company has deployed an API using Amazon API Gateway. There are many repeat requests and a solutions architect has been asked to

implement measures to reduce request latency and the number of calls to the Amazon EC2 endpoint.

How can this be most easily achieved?

1: Create a cache for a stage and configure a TTL

2: Create a cache for a method and configure a TTL

3: Configure an edge-optimized endpoint with CloudFront

4: Configure a private endpoint place ElastiCache in front

4. Question

A Solutions Architect is designing a migration strategy for a company moving to the AWS Cloud. The company use a shared Microsoft filesystem that uses Distributed File System Namespaces (DFSN). What will be the MOST suitable migration strategy for the filesystem?

1: Use the AWS Server Migration Service to migrate to an Amazon S3 bucket

2: Use the AWS Server Migration Service to migrate to Amazon FSx for Lustre

3: Use AWS DataSync to migrate to an Amazon EFS filesystem

4: Use AWS DataSync to migrate to Amazon FSx for Windows File Server

5. Question

An Amazon ElastiCache for Redis cluster runs across multiple Availability Zones. A solutions architect is concerned about the security of sensitive data as it is replicated between nodes. How can the solutions architect protect the sensitive data?

1: Issue a Redis AUTH command

2: Enable in-transit encryption

3: Enable at-rest encryption

4: Set up MFA and API logging

6. Question

A company runs an application on-premises that must consume a REST API running on Amazon API Gateway. The company has an AWS Direct Connect connection to their Amazon VPC. The solutions

architect wants all API calls to use private addressing only and avoid the internet. How can this be achieved?

1: Use a transit virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway

2: Use a private virtual interface and create a VPC Endpoint for Amazon API Gateway

3: Use a hosted virtual interface and create a VPC Endpoint for Amazon API Gateway

4: Use a public virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway

7. Question

A company has an eCommerce application that runs from multiple AWS Regions. Each region has a separate database running on Amazon EC2 instances. The company plans to consolidate the data to a columnar database and run analytics queries. Which approach should the company take?

1: Run an AWS Batch job to copy and process the data into a columnar Amazon RDS database. Use Amazon Athena to analyze the data

2: Use the COPY command to load data into an Amazon RedShift data warehouse and run the analytics queries there

3: Launch Amazon Kinesis Data Streams producers to load data into a Kinesis Data stream. Use Kinesis Data Analytics to analyze the data

4: Create an AWS Lambda function that copies the data onto Amazon S3. Use Amazon S3 Select to query the data

8. Question

There has been an increase in traffic to an application that writes data to an Amazon DynamoDB database. Thousands of random tables reads occur per second and low-latency is required. What can a Solutions Architect do to improve performance for the reads without negatively impacting the rest of the application?

1: Increase the number of Amazon DynamoDB write capacity units

2: Add an Amazon SQS queue to decouple the requests

3: Use Amazon DynamoDB Accelerator to cache the reads

4: Use an Amazon Kinesis Data Stream to decouple requests

9. Question

A Solutions Architect must enable an application to download software updates from the internet. The application runs on a series of EC2 instances in an Auto Scaling group running in a private subnet. The solution must involve minimal ongoing systems management effort. How should the Solutions Architect proceed?

1: Implement a NAT gateway

2: Launch a NAT instance

3: Create a Virtual Private Gateway

4: Attach Elastic IP addresses

10. Question

A Solutions Architect manages multiple Amazon RDS MySQL databases. To improve security, the Solutions Architect wants to enable secure user access with short-lived credentials. How can these requirements be met?

1: Configure the MySQL databases to use the AWS Security Token Service (STS)

2: Configure the application to use the AUTH command to send a unique password

3: Create the MySQL user accounts to use the AWSAuthenticationPlugin with IAM

4: Configure the MySQL databases to use AWS KMS data encryption keys

11. Question

An application running a private subnet of an Amazon VPC must have outbound internet access for downloading updates. The Solutions Architect does not want the application exposed to inbound connection attempts. Which steps should be taken?

1: Create a NAT gateway but do not create attach an internet gateway to the VPC

2: Attach an internet gateway to the private subnet and create a NAT gateway

3: Attach an internet gateway to the VPC but do not create a NAT gateway
4: Create a NAT gateway and attach an internet gateway to the VPC

12. Question

An application has been migrated from on-premises to an Amazon EC2 instance. The migration has failed to an unknown dependency that the application must communicate with an on-premises server using private IP addresses.

Which action should a solutions architect take to quickly provision the necessary connectivity?

1. Question

1: Setup an AWS Direct Connect connection
2: Configure a Virtual Private Gateway
3: Create an Amazon CloudFront distribution
4: Create an AWS Transit Gateway

13. Question

A company runs an API on a Linux server in their on-premises data center. The company are planning to migrate the API to the AWS cloud. The company require a highly available, scalable and cost-effective solution. What should a Solutions Architect recommend?

1: Migrate the API to Amazon API Gateway and migrate the backend to Amazon EC2
2: Migrate the API server to Amazon EC2 instances in an Auto Scaling group and attach an Application Load Balancer
3: Migrate the API to Amazon API Gateway and use AWS Lambda as the backend
4: Migrate the API to Amazon CloudFront and use AWS Lambda as the origin

14. Question

An application that is being installed on an Amazon EC2 instance requires a persistent block storage volume. The data must be encrypted at rest and regular volume-level backups must be automated.

Which solution options should be used?

1: Use an encrypted Amazon EBS volume and use Data Lifecycle Manager to automate snapshots

2: Use an encrypted Amazon EFS filesystem and use an Amazon CloudWatch Events rule to start a backup copy of data using AWS Lambda

3: Use server-side encryption on an Amazon S3 bucket and use Cross-Region-Replication to backup on a schedule

4: Use an encrypted Amazon EC2 instance store and copy the data to another EC2 instance using a cron job and a batch script

15. Question

A company has several AWS accounts each with multiple Amazon VPCs. The company must establish routing between all private subnets. The architecture should be simple and allow transitive routing to occur.

How should the network connectivity be configured?

1: Create a transitive VPC peering connection between each Amazon VPC and configure route tables

2: Create an AWS Transit Gateway and share it with each account using AWS Resource Access Manager

3: Create an AWS Managed VPN between each Amazon VPC and configure route tables

4: Create a hub-and-spoke topology with AWS App Mesh and use AWS Resource Access Manager to share route tables

16. Question

An organization is planning their disaster recovery solution. They would like to keep their core business critical systems running in the cloud. Other services can be replicated but switched off.

Which DR strategy should a Solutions Architect recommend?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

17. Question

An application analyzes images of people that are uploaded to an Amazon S3 bucket. The application determines demographic data which is then saved to a .CSV file in another S3 bucket. The data must be encrypted at rest and then queried using SQL. The solution should be fully serverless.

Which actions should a Solutions Architect take to encrypt and query the data?

1: Use Amazon S3 server-side encryption and use Amazon RedShift Spectrum to query the data

2: Use AWS KMS encryption keys for the S3 bucket and use Amazon Athena to query the data

3: Use AWS KMS encryption keys for the S3 bucket and use Amazon Kinesis Data Analytics to query the data

4: Use Amazon S3 server-side encryption and Amazon QuickSight to query the data

18. Question

A large quantity of data is stored on a NAS device on-premises and accessed using the SMB protocol. The company require a managed service for hosting the filesystem and a tool to automate the migration.

Which actions should a Solutions Architect take?

1: Migrate the data to Amazon EFS using the AWS Server Migration Service (SMS)

2: Migrate the data to Amazon FSx for Lustre using AWS DataSync

3: Migrate the data to Amazon FSx for Windows File Server using AWS DataSync

4: Migrate the data to Amazon S3 using and AWS Snowball Edge device

19. Question

The database layer of an on-premises web application is being migrated to AWS. The database uses a multi-threaded, in-memory caching layer to improve performance for repeated queries. Which service would be the most suitable replacement for the database cache?

1: Amazon ElastiCache Redis

2: Amazon DynamoDB DAX

3: Amazon ElastiCache Memcached
4: Amazon RDS MySQL

20. Question

A Solutions Architect is designing an application for processing and extracting data from log files. The log files are generated by an application and the number and frequency of updates varies. The files are up to 1 GB in size and processing will take around 40 seconds for each file.

Which solution is the most cost-effective?

1: Write the log files to an Amazon EC2 instance with an attached EBS volume. After processing, save the files to an Amazon S3 bucket
2: Write the log files to an Amazon SQS queue. Use AWS Lambda to process the files from the queue and save to an Amazon S3 bucket
3: Write the log files to an Amazon S3 bucket. Create an event notification to invoke an Amazon ECS task to process the files and save to an Amazon S3 bucket
4: Write the log files to an Amazon S3 bucket. Create an event notification to invoke an AWS Lambda function that will process the files

21. Question

A large multinational retail company has a presence in AWS in multiple regions. The company has established a new office and needs to implement a high-bandwidth, low-latency connection to multiple VPCs in multiple regions within the same account. The VPCs each have unique CIDR ranges.

What would be the optimum solution design using AWS technology? (Select TWO)

1: Configure AWS VPN CloudHub
2: Create a Direct Connect gateway, and create private VIFs to each region
3: Provision an MPLS network
4: Implement Direct Connect connections to each AWS region
5: Implement a Direct Connect connection to the closest AWS region

22. Question

A Solutions Architect is creating a design for a two-tier application with a MySQL RDS back-end. The performance requirements of the database tier are hard to quantify until the application is running and the Architect is concerned about right-sizing the database.

What methods of scaling are possible after the MySQL RDS database is deployed? (Select TWO)

1: Vertical scaling for read and write by choosing a larger instance size

2: Horizontal scaling for write capacity by enabling Multi-AZ

3: Vertical scaling for read and write by using Transfer Acceleration

4: Horizontal scaling for read and write by enabling Multi-Master RDS DB

5: Horizontal scaling for read capacity by creating a read-replica

23. Question

An application is running on EC2 instances in a private subnet of an Amazon VPC. A Solutions Architect would like to connect the application to Amazon API Gateway. For security reasons, it is necessary to ensure that no traffic traverses the Internet and to ensure all traffic uses private IP addresses only.

How can this be achieved?

1: Create a NAT gateway

2: Create a public VIF on a Direct Connect connection

3: Create a private API using an interface VPC endpoint

4: Add the API gateway to the subnet the EC2 instances are located in

24. Question

An application stack is being created which needs a message bus to decouple the application components from each other. The application will generate up to 300 messages per second without using batching. A Solutions Architect needs to ensure that a message is delivered only once and duplicates are not introduced into the queue. It is not necessary to maintain the order of the messages.

Which SQS queue type should be used?

1: Standard queues

2: Long polling queues

3: FIFO queues

4: Auto Scaling queues

25. Question

A Solutions Architect is attempting to clean up unused EBS volumes and snapshots to save some space and cost. How many of the most recent snapshots of an EBS volume need to be maintained to guarantee that you can recreate the full EBS volume from the snapshot?

1: You must retain all snapshots as the process is incremental and therefore data is required from each snapshot

2: Two snapshots, the oldest and most recent snapshots

3: The oldest snapshot, as this references data in all other snapshots

4: Only the most recent snapshot. Snapshots are incremental, but the deletion process will ensure that no data is lost

26. Question

A Python application is currently running on Amazon ECS containers using the Fargate launch type. An ALB has been created with a Target Group that routes incoming connections to the ECS-based application. The application will be used by consumers who will authenticate using federated OIDC compliant Identity Providers such as Google and Facebook. The users must be securely authenticated on the front-end before they access the secured portions of the application.

How can this be configured using an ALB?

1: The only option is to use SAML with Amazon Cognito on the ALB

2: This can be done on the ALB by creating an authentication action on a listener rule that configures an Amazon Cognito user pool with the social IdP

3: This cannot be done on an ALB; you'll need to authenticate users on the back-end with AWS Single Sign-On (SSO) integration

4: This cannot be done on an ALB; you'll need to use another layer in front of the ALB

27. Question

A Solutions Architect is creating a solution for an application that must be deployed on Amazon EC2 hosts that are dedicated to the client.

Instance placement must be automatic and billing should be per instance.

Which type of EC2 deployment model should be used?

1: Reserved Instance

2: Dedicated Instance

3: Dedicated Host

4: Cluster Placement Group

28. Question

There is new requirement for a database that will store a large number of records for an online store. You are evaluating the use of DynamoDB. Which of the following are AWS best practices for DynamoDB? (Select TWO)

1: Use separate local secondary indexes for each item

2: Store objects larger than 400KB in S3 and use pointers in DynamoDB

3: Store more frequently and less frequently accessed data in separate tables

4: Use for BLOB data use cases

5: Use large files

29. Question

A Solutions Architect needs to migrate an Oracle database running on RDS onto Amazon RedShift to improve performance and reduce cost. What combination of tasks using AWS services should be followed to execute the migration? (Select TWO)

1: Migrate the database using the AWS Database Migration Service (DMS)

2: Convert the schema using the AWS Schema Conversion Tool

3: Take a snapshot of the Oracle database and restore the snapshot onto RedShift

4: Configure API Gateway to extract, transform and load the data into RedShift

5: Enable log shipping from the Oracle database to RedShift

30. Question

A client has made some updates to their web application. The application uses an Auto Scaling Group to maintain a group of several

EC2 instances. The application has been modified and a new AMI must be used for launching any new instances.

What does a Solutions Architect need to do to add the new AMI?

1: Create a new target group that uses a new launch configuration with the new AMI

2: Modify the existing launch configuration to add the new AMI

3: Suspend Auto Scaling and replace the existing AMI

4: Create a new launch configuration that uses the AMI and update the ASG to use the new launch configuration

31. Question

A Solutions Architect regularly deploys and manages infrastructure services for customers on AWS. The SysOps team are facing challenges in tracking changes that are made to the infrastructure services and rolling back when problems occur.

How can a Solutions Architect BEST assist the SysOps team?

1: Use AWS Systems Manager to manage all updates to the infrastructure services

2: Use CodeDeploy to manage version control for the infrastructure services

3: Use CloudFormation templates to deploy and manage the infrastructure services

4: Use Trusted Advisor to record updates made to the infrastructure services

32. Question

A Solutions Architect is designing the compute layer of a serverless application. The compute layer will manage requests from external systems, orchestrate serverless workflows, and execute the business logic.

The Architect needs to select the most appropriate AWS services for these functions. Which services should be used for the compute layer? (Select TWO)

1: Use Amazon ECS for executing the business logic

2: Use AWS CloudFormation for orchestrating serverless workflows

3: Use AWS Step Functions for orchestrating serverless workflows

4: Use AWS Elastic Beanstalk for executing the business logic

5: Use Amazon API Gateway with AWS Lambda for executing the business logic

33. Question

An application running in an on-premise data center writes data to a MySQL database. A Solutions Architect is re-architecting the application and plans to move the database layer into the AWS cloud on Amazon RDS. The application layer will run in the on-premise data center.

What must be done to connect the application to the RDS database via the Internet? (Select TWO)

1: Configure a NAT Gateway and attach the RDS database

2: Choose to make the RDS instance publicly accessible and place it in a public subnet

3: Select a public IP within the DB subnet group to assign to the RDS instance

4: Create a security group allowing access from the on-premise public IP to the RDS instance and assign to the RDS instance

5: Create a DB subnet group that is publicly accessible

34. Question

A Solutions Architect is conducting an audit and needs to query several properties of EC2 instances in a VPC. Which two methods are available for accessing and querying the properties of an EC2 instance such as instance ID, public keys and network interfaces? (Select TWO)

1: Use the EC2 Config service

2: Run the command “curl http://169.254.169.254/latest/meta-data/”

3: Download and run the Instance Metadata Query Tool

4: Run the command “curl http://169.254.169.254/latest/dynamic/instance-identity/”

5: Use the Batch command

35. Question

Encrypted Amazon Elastic Block Store (EBS) volumes are attached to some Amazon EC2 instances. Which statements are correct about using

encryption with Amazon EBS volumes? (Select TWO)

1: Data is only encrypted at rest

2: Encryption is supported on all Amazon EBS volume types

3: Data in transit between an instance and an encrypted volume is also encrypted

4: Volumes created from encrypted snapshots are unencrypted

5: You cannot mix encrypted with unencrypted volumes on an instance

36. Question

An operations team would like to be notified if an RDS database exceeds certain metric thresholds. How can a Solutions Architect automate this process for the operations team?

1: Create a CloudWatch alarm and associate an SQS queue with it that delivers a message to SES

2: Setup an RDS alarm and associate an SNS topic with it that sends an email

3: Create a CloudTrail alarm and configure a notification event to send an SMS

4: Create a CloudWatch alarm and associate an SNS topic with it that sends an email notification

37. Question

An Amazon VPC contains a mixture of Amazon EC2 instances in production and non-production environments. A Solutions Architect needs to devise a way to segregate access permissions to different sets of users for instances in different environments.

How can this be achieved? (Select TWO)

1: Attach an Identity Provider (IdP) and delegate access to the instances to the relevant groups

2: Create an IAM policy that grants access to any instances with the specific tag and attach to the users and groups

3: Create an IAM policy with a conditional statement that matches the environment variables

4: Add an environment variable to the instances using user data

5: Add a specific tag to the instances you want to grant the users or groups access to

38. Question

A customer runs an application on-premise that stores large media files. The data is mounted to different servers using either the SMB or NFS protocols. The customer is having issues with scaling the storage infrastructure on-premise and is looking for a way to offload the data set into the cloud whilst retaining a local cache for frequently accessed content.

Which of the following is the best solution?

1: Use the AWS Storage Gateway File Gateway

2: Use the AWS Storage Gateway Volume Gateway in cached volume mode

3: Create a script that migrates infrequently used data to S3 using multi-part upload

4: Establish a VPN and use the Elastic File System (EFS)

39. Question

A client has requested a design for a fault tolerant database that can failover between AZs. You have decided to use RDS in a multi-AZ configuration. What type of replication will the primary database use to replicate to the standby instance?

1: Continuous replication

2: Asynchronous replication

3: Scheduled replication

4: Synchronous replication

40. Question

A Solutions Architect needs a storage solution for a fleet of Linux web application servers. The solution should provide a file system interface and be able to support millions of files. Which AWS service should the Architect choose?

1: Amazon ElastiCache

2: Amazon EBS

3: Amazon EFS

4: Amazon S3

41. Question

A Solutions Architect is creating an application design with several components that will be publicly addressable. The Architect would like to use Alias records. Using Route 53 Alias records what targets can you specify? (Select TWO)

1: CloudFront distribution
2: ElastiCache cluster
3: EFS filesystems
4: Elastic Beanstalk environment
5: On-premise web server

42. Question

A new financial platform has been re-architected to use Docker containers in a micro-services architecture. The new architecture will be implemented on AWS and a Solutions Architect must recommend the solution configuration. For operational reasons, it will be necessary to access the operating system of the instances on which the containers run.

Which solution delivery option should the Architect select?

1: ECS with the EC2 launch type
2: EKS with Kubernetes managed infrastructure
3: ECS with the Fargate launch type
4: ECS with a default cluster

43. Question

A new application runs on Amazon EC2 instances and uses API Gateway and AWS Lambda. The company is planning on running an advertising campaign that will likely result in significant hits to the application after each ad is run.

A Solutions Architect is concerned about the impact this may have on the application and would like to put in place some controls to limit the number of requests per second that hit the application.

What controls should the Solutions Architect implement?

1: Implement throttling rules on the API Gateway

2: Enable caching on the API Gateway and specify a size in gigabytes

3: Enable Lambda continuous scaling

4: API Gateway and Lambda scale automatically to handle any load so there's no need to implement controls

44. Question

A Solutions Architect has deployed a number of AWS resources using CloudFormation. Some changes must be made to a couple of resources within the stack. Due to recent failed updates, the Solutions Architect is a little concerned about the effects that implementing updates to the resources might have on other resources in the stack.

What is the easiest way to proceed cautiously?

1: Create and execute a change set

2: Use OpsWorks to manage the configuration changes

3: Use a direct update

4: Deploy a new stack to test the changes

45. Question

A company has over 2000 users and is planning to migrate data into the AWS Cloud. Some of the data is user's home folders on an existing file share and the plan is to move this data to Amazon S3. Each user will have a folder in a shared bucket under the folder structure: *bucket* /home/%username%.

What steps should a Solutions Architect take to ensure that each user can access their own home folder and no one else's? (Select TWO)

1: Create a bucket policy that applies access permissions based on username

2: Create an IAM policy that applies folder-level permissions

3: Create an IAM policy that applies object-level S3 ACLs

4: Attach an S3 ACL sub-resource that grants access based on the %username% variable

5: Create an IAM group and attach the IAM policy, add IAM users to the group

46. Question

An event in CloudTrail is the record of an activity in an AWS account. What are the two types of events that can be logged in CloudTrail? (Select TWO)

1: Platform Events which are also known as hardware level operations

2: Data Events which are also known as data plane operations

3: System Events which are also known as instance level operations

4: Control Events which are also known as data plane operations

5: Management Events which are also known as control plane operations

47. Question

A Solutions Architect is writing some code that uses an AWS Lambda function and would like to enable the function to connect to an Amazon ElastiCache cluster within an Amazon VPC in the same AWS account. What VPC-specific information must be included in the function to enable this configuration? (Select TWO)

1: VPC Subnet IDs

2: VPC Logical IDs

3: VPC Peering IDs

4: VPC Security Group IDs

5: VPC Route Table IDs

48. Question

A Solutions Architect created a new subnet in an Amazon VPC and launched an Amazon EC2 instance into it. The Solutions Architect needs to directly access the EC2 instance from the Internet and cannot connect. Which steps should be undertaken to troubleshoot the issue? (Select TWO)

1: Check that the instance has a public IP address

2: Check that there is a NAT Gateway configured for the subnet

3: Check that Security Group has a rule for outbound traffic

4: Check that the route table associated with the subnet has an entry for an Internet Gateway

5: Check that you can ping the instance from another subnet

49. Question

A Solutions Architect just completed the implementation of a 2-tier web application for a client. The application uses Amazon EC2 instances, Amazon ELB and Auto Scaling across two subnets. After deployment the Solutions Architect noticed that only one subnet has EC2 instances running in it. What might be the cause of this situation?

1: The ELB is configured as an internal-only load balancer

2: The Auto Scaling Group has not been configured with multiple subnets

3: Cross-zone load balancing is not enabled on the ELB

4: The AMI is missing from the ASG's launch configuration

50. Question

A Solutions Architect is designing the messaging and streaming layers of a serverless application. The messaging layer will manage communications between components and the streaming layer will manage real-time analysis and processing of streaming data.

The Architect needs to select the most appropriate AWS services for these functions. Which services should be used for the messaging and streaming layers? (Select TWO)

1: Use Amazon Kinesis for collecting, processing and analyzing real-time streaming data

2: Use Amazon SWF for providing a fully managed messaging service

3: Use Amazon SNS for providing a fully managed messaging service

4: Use Amazon EMR for collecting, processing and analyzing real-time streaming data

5: Use AWS CloudTrail for collecting, processing and analyzing real-time streaming data

51. Question

An existing Auto Scaling group is running with eight Amazon EC2 instances. A Solutions Architect has attached an Elastic Load Balancer (ELB) to the Auto Scaling group by connecting a Target Group. The ELB is in the same region and already has ten EC2 instances running in the Target Group.

When attempting to attach the ELB the request immediately fails, what is the MOST likely cause?

1: Adding the 10 EC2 instances to the ASG would exceed the maximum capacity configured
2: One or more of the instances are unhealthy
3: ASGs cannot be edited once defined, you would need to recreate it
4: You cannot attach running EC2 instances to an ASG

52. Question

The AWS Acceptable Use Policy describes permitted and prohibited behavior on AWS and includes descriptions of prohibited security violations and network abuse. According to the policy, what is AWS's position on penetration testing?

1: AWS do not allow any form of penetration testing
2: AWS allow penetration testing by customers on their own VPC resources
3: AWS allow penetration for some resources without prior authorization
4: AWS allow penetration testing for all resources

53. Question

An application regularly uploads files from an Amazon EC2 instance to an Amazon S3 bucket. The files can be a couple of gigabytes in size and sometimes the uploads are slower than desired. What method can be used to increase throughput and reduce upload times?

1: Turn off versioning on the destination bucket
2: Randomize the object names when uploading
3: Use Amazon S3 multipart upload
4: Upload the files using the S3 Copy SDK or REST API

54. Question

A three-tier web application that is deployed in an Amazon VPC has been experiencing heavy load on the database layer. The database layer uses an Amazon RDS MySQL instance in a multi-AZ configuration. Customers have been complaining about poor response times. During troubleshooting it has been noted that the database layer is experiencing high read contention during peak hours of the day.

What are two possible options that could be used to offload some of the read traffic from the database to resolve the performance issues? (Select

TWO)

1: Add RDS read replicas in each AZ

2: Use an ELB to distribute load between RDS instances

3: Migrate to DynamoDB

4: Use a larger RDS instance size

5: Deploy ElastiCache in each AZ

55. Question

A Solutions Architect is creating a multi-tier application that includes loosely-coupled, distributed application components and needs to determine a method of sending notifications instantaneously. Using Amazon SNS which transport protocols are supported? (Select TWO)

1: Amazon SWF

2: FTP

3: HTTPS

4: AWS Lambda

5: Email-JSON

56. Question

A manager is concerned that the default service limits my soon be reached for several AWS services. Which AWS tool can a Solutions Architect use to display current usage and limits?

1: AWS Systems Manager

2: AWS Trusted Advisor

3: AWS Dashboard

4: Amazon CloudWatch

57. Question

A company has multiple AWS accounts for several environments (Prod, Dev, Test etc.). A Solutions Architect would like to copy an Amazon EBS snapshot from DEV to PROD. The snapshot is from an EBS volume that was encrypted with a custom key.

What steps must be performed to share the encrypted EBS snapshot with the Prod account? (Select TWO)

1: Share the custom key used to encrypt the volume

2: Make a copy of the EBS volume and unencrypt the data in the process
3: Create a snapshot of the unencrypted volume and share it with the Prod account
4: Modify the permissions on the encrypted snapshot to share it with the Prod account
5: Use CloudHSM to distribute the encryption keys use to encrypt the volume

58. Question

An application you manage runs a number of components using a micro-services architecture. Several ECS container instances in your ECS cluster are displaying as disconnected. The ECS instances were created from the Amazon ECS-Optimized AMI. What steps might you take to troubleshoot the issue? (Select TWO)

1: Verify that the instances have the correct IAM group applied
2: Verify that the container instances have the container agent installed
3: Verify that the IAM instance profile has the necessary permissions
4: Verify that the container agent is running on the container instances
5: Verify that the container instances are using the Fargate launch type

59. Question

The application development team in a company have created a new application written in .NET. A Solutions Architect is looking for a way to easily deploy the application whilst maintaining full control of the underlying resources.

Which PaaS service provided by AWS would BEST suit this requirement?

1: CloudFront
2: Elastic Beanstalk
3: EC2 Placement Groups
4: CloudFormation

60. Question

A Solutions Architect is building a small web application running on Amazon EC2 that will be serving static content. The user base is spread

out globally and speed is important. Which AWS service can deliver the best user experience cost-effectively and reduce the load on the web server?

1: Amazon RedShift
2: Amazon S3
3: Amazon CloudFront
4: Amazon EBS volume

61. Question

Amazon CloudWatch is being used to monitor the performance of AWS Lambda. Which metrics does Lambda track? (Select TWO)

1: Total number of requests
2: Latency per request
3: Number of users
4: Total number of connections
5: Total number of transactions

62. Question

An Amazon EC2 instance running a video on demand web application has been experiencing high CPU utilization. A Solutions Architect needs to take steps to reduce the impact on the EC2 instance and improve performance for consumers. Which of the steps below would help?

1: Use ElastiCache as the web front-end and forward connections to EC2 for cache misses
2: Create a CloudFront distribution and configure a custom origin pointing at the EC2 instance
3: Create an ELB and place it in front of the EC2 instance
4: Create a CloudFront RTMP distribution and point it at the EC2 instance

63. Question

A Solutions Architect needs to create a file system that can be concurrently accessed by multiple Amazon EC2 instances across multiple availability zones. The file system needs to support high throughput and the ability to burst. As the data that will be stored on

the file system will be sensitive, it must be encrypted at rest and in transit.

Which storage solution should the Solutions Architect use for the shared file system?

1: Add EBS volumes to each EC2 instance and configure data replication

2: Use the Elastic Block Store (EBS) and mount the file system at the block level

3: Use the Elastic File System (EFS) and mount the file system using NFS

4: Add EBS volumes to each EC2 instance and use an ELB to distribute data evenly between the volumes

64. Question

A new department will begin using AWS services an AWS account and a Solutions Architect needs to create an authentication and authorization strategy. Select the correct statements regarding IAM groups? (Select TWO)

1: IAM groups can be used to assign permissions to users

2: IAM groups can be nested up to 4 levels

3: IAM groups can be used to group EC2 instances

4: IAM groups can temporarily assume a role to take on permissions for a specific task

5: An IAM group is not an identity and cannot be identified as a principal in an IAM policy

65. Question

The development team in a media organization is moving their SDLC processes into the AWS Cloud. Which AWS service can a Solutions Architect recommend that is primarily used for software version control?

1: CloudHSM

2: CodeStar

3: CodeCommit

4: Step Functions

SET 5: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

A Solutions Architect has deployed an API using Amazon API Gateway and created usage plans and API keys for several customers. Requests from one particular customer have been excessive and the solutions architect needs to limit the rate of requests. Other customers should not be affected. How should the solutions architect proceed?

1: Configure a server-side throttling limit

2: Configure the per-method throttling limits

3: Configure per-client throttling limits

4: Configure the account-level throttling limits

Answer: 3

Explanation:

Per-client throttling limits are applied to clients that use API keys associated with your usage policy as client identifier. This can be applied to the single customer that is issuing excessive API requests. This is the best option to ensure that only one customer is affected.

CORRECT: "Configure per-client throttling limits" is the correct answer.

INCORRECT: "Configure a server-side throttling limit" is incorrect. Server-side throttling limits are applied across all clients. These limit settings exist to prevent your API—and your account—from being overwhelmed by too many requests. In this case, the solutions architect need to apply the throttling to a single client.

INCORRECT: "Configure the per-method throttling limits" is incorrect. Per-method throttling limits apply to all customers using the same method. This will affect all customers who are using the API.

INCORRECT: "Configure the account-level throttling limits" is incorrect. Account-level throttling limits define the maximum steady-state request rate and burst limits for the account. This does not apply to individual customers.

2. Question

A Solutions Architect is deploying a high performance computing (HPC) application on Amazon EC2 instances. The application requires extremely low inter-instance latency. How should the instances be deployed for BEST performance?

1: Use an instance with enhanced networking and deploy the instances in a partition placement group

2: Use an Elastic Fabric Adapter (EFA) and deploy instances in a cluster placement group

3: Add multiple Elastic Network Adapters (ENAs) to each instance and create a NIC team

4: Use an EBS-optimized instance with 10 Gigabit networking and deploy to a single subnet

Answer: 2

Explanation:

It is recommended to use either enhanced networking or an Elastic Fabric Adapter (EFA) for the nodes of an HPC application. This will assist with decreasing latency. Additionally, a cluster placement group packs instances close together inside an Availability Zone.

Using a cluster placement group enables workloads to achieve the low-latency network performance necessary for tightly-coupled node-to-node communication that is typical of HPC applications.

CORRECT: "Use an Elastic Fabric Adapter (EFA) and deploy instances in a cluster placement group" is the correct answer.

INCORRECT: "Use an instance with enhanced networking and deploy the instances in a partition placement group" is incorrect. A partition placement group protects instances from correlated hardware failures, it does not offer the best inter-instance network performance.

INCORRECT: "Add multiple Elastic Network Adapters (ENAs) to each instance and create a NIC team" is incorrect. You cannot use NIC teaming methods on AWS to increase the bandwidth to your application. This will also not reduce latency.

INCORRECT: "Use an EBS-optimized instance with 10 Gigabit networking and deploy to a single subnet" is incorrect. EBS optimization is

related to storage, not to network performance. A 10 Gigabit adapter offers great bandwidth but for lowest latency enhanced networking with a cluster placement group should be used.

3. Question

A company has deployed an API using Amazon API Gateway. There are many repeat requests and a solutions architect has been asked to implement measures to reduce request latency and the number of calls to the Amazon EC2 endpoint.

How can this be most easily achieved?

1: Create a cache for a stage and configure a TTL

2: Create a cache for a method and configure a TTL

3: Configure an edge-optimized endpoint with CloudFront

4: Configure a private endpoint place ElastiCache in front

Answer: 1

Explanation:

You can enable API caching in Amazon API Gateway to cache your endpoint's responses. With caching, you can reduce the number of calls made to your endpoint and also improve the latency of requests to your API.

When you enable caching for a stage, API Gateway caches responses from your endpoint for a specified time-to-live (TTL) period, in seconds. API Gateway then responds to the request by looking up the endpoint response from the cache instead of making a request to your endpoint. The default TTL value for API caching is 300 seconds. The maximum TTL value is 3600 seconds. TTL=0 means caching is disabled.

CORRECT: "Create a cache for a stage and configure a TTL" is the correct answer.

INCORRECT: "Create a cache for a method and configure a TTL" is incorrect. An API cache is not enabled for a method, it is enabled for a stage.

INCORRECT: "Configure an edge-optimized endpoint with CloudFront" is incorrect. This is the default endpoint type with API Gateway so there’s no reason to believe the solution architect needs to configure this. Users are

routed to the nearest CloudFront point of presence (POP). However, caching still takes place within API gateway using a stage cache.

INCORRECT: "Configure a private endpoint place ElastiCache in front" is incorrect. You cannot use Amazon ElastiCache to cache API requests.

4. Question

A Solutions Architect is designing a migration strategy for a company moving to the AWS Cloud. The company use a shared Microsoft filesystem that uses Distributed File System Namespaces (DFSN). What will be the MOST suitable migration strategy for the filesystem?

1: Use the AWS Server Migration Service to migrate to an Amazon S3 bucket

2: Use the AWS Server Migration Service to migrate to Amazon FSx for Lustre

3: Use AWS DataSync to migrate to an Amazon EFS filesystem

4: Use AWS DataSync to migrate to Amazon FSx for Windows File Server

Answer: 4

Explanation:

The destination filesystem should be Amazon FSx for Windows File Server. This supports DFSN and is the most suitable storage solution for Microsoft filesystems. AWS DataSync supports migrating to the Amazon FSx and automates the process.

CORRECT: "Use AWS DataSync to migrate to Amazon FSx for Windows File Server" is the correct answer.

INCORRECT: "Use the AWS Server Migration Service to migrate to Amazon FSx for Lustre" is incorrect. The server migration service is used to migrate virtual machines and FSx for Lustre does not support Windows filesystems.

INCORRECT: "Use AWS DataSync to migrate to an Amazon EFS filesystem" is incorrect. You can migrate data to EFS using DataSync but it is the wrong destination for a Microsoft filesystem (Linux only).

INCORRECT: "Use the AWS Server Migration Service to migrate to an Amazon S3 bucket" is incorrect. The server migration service is used to

migrate virtual machines and Amazon S3 is an object-based storage system and unsuitable for hosting a Microsoft filesystem.

5. Question

An Amazon ElastiCache for Redis cluster runs across multiple Availability Zones. A solutions architect is concerned about the security of sensitive data as it is replicated between nodes. How can the solutions architect protect the sensitive data?

1: Issue a Redis AUTH command

2: Enable in-transit encryption

3: Enable at-rest encryption

4: Set up MFA and API logging

Answer: 2

Explanation:

Amazon ElastiCache in-transit encryption is an optional feature that allows you to increase the security of your data at its most vulnerable points—when it is in transit from one location to another. Because there is some processing needed to encrypt and decrypt the data at the endpoints, enabling in-transit encryption can have some performance impact. You should benchmark your data with and without in-transit encryption to determine the performance impact for your use cases.

ElastiCache in-transit encryption implements the following features:

- **Encrypted connections** —both the server and client connections are Secure Socket Layer (SSL) encrypted.
- **Encrypted replication—** data moving between a primary node and replica nodes is encrypted.
- **Server authentication** —clients can authenticate that they are connecting to the right server.
- **Client authentication** —using the Redis AUTH feature, the server can authenticate the clients.

CORRECT: "Enable in-transit encryption" is the correct answer.

INCORRECT: "Issue a Redis AUTH command" is incorrect. This is used when using a password to access the database.

INCORRECT: "Enable at-rest encryption" is incorrect. ElastiCache for Redis at-rest encryption is an optional feature to increase data security by encrypting on-disk data. This does not encrypt the data in-transit when it is being replicated between nodes.

INCORRECT: "Set up MFA and API logging" is incorrect. Neither multi-factor authentication or API logging is going to assist with encrypting data.

6. Question

A company runs an application on-premises that must consume a REST API running on Amazon API Gateway. The company has an AWS Direct Connect connection to their Amazon VPC. The solutions architect wants all API calls to use private addressing only and avoid the internet. How can this be achieved?

1: Use a transit virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway

2: Use a private virtual interface and create a VPC Endpoint for Amazon API Gateway

3: Use a hosted virtual interface and create a VPC Endpoint for Amazon API Gateway

4: Use a public virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway

Answer: 2

Explanation:

The requirements are to avoid the internet and use private IP addresses only. The best solution is to use a private virtual interface across the Direct Connect connection to connect to the VPC using private IP addresses. A VPC endpoint for Amazon API Gateway can be created and this will provide access to API Gateway using private IP addresses and avoids the internet completely.

CORRECT: "Use a private virtual interface and create a VPC Endpoint for Amazon API Gateway" is the correct answer.

INCORRECT: "Use a hosted virtual interface and create a VPC Endpoint for Amazon API Gateway" is incorrect. A hosted virtual interface is used to allow another account to access your Direct Connect link.

INCORRECT: "Use a transit virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway" is incorrect. A transit virtual interface is used to access Amazon VPC Transit Gateways which are not included in the solution.

INCORRECT: "Use a public virtual interface and an AWS VPN to create a secure tunnel to Amazon API Gateway" is incorrect. This will use the public internet so it is not allowed in this scenario.

7. Question

A company has an eCommerce application that runs from multiple AWS Regions. Each region has a separate database running on Amazon EC2 instances. The company plans to consolidate the data to a columnar database and run analytics queries. Which approach should the company take?

1: Run an AWS Batch job to copy and process the data into a columnar Amazon RDS database. Use Amazon Athena to analyze the data

2: Use the COPY command to load data into an Amazon RedShift data warehouse and run the analytics queries there

3: Launch Amazon Kinesis Data Streams producers to load data into a Kinesis Data stream. Use Kinesis Data Analytics to analyze the data

4: Create an AWS Lambda function that copies the data onto Amazon S3. Use Amazon S3 Select to query the data

Answer: 2

Explanation:

Amazon Redshift is an enterprise-level, petabyte scale, fully managed data warehousing service. It uses columnar storage to improve the performance of complex queries.

You can use the COPY command to load data in parallel from one or more remote hosts, such Amazon EC2 instances or other computers. COPY connects to the remote hosts using SSH and executes commands on the remote hosts to generate text output.

CORRECT: "Use the COPY command to load data into an Amazon RedShift data warehouse and run the analytics queries there" is the correct answer.

INCORRECT: "Run an AWS Batch job to copy and process the data into a columnar Amazon RDS database. Use Amazon Athena to analyze the data" is incorrect. AWS Batch is used for running batch computing jobs across a fleet of EC2 instances. You cannot create a “columnar Amazon RDS database” as RDS is optimized for transactional workloads. Athena is used to analyze data on S3.

INCORRECT: "Launch Amazon Kinesis Data Streams producers to load data into a Kinesis Data stream. Use Kinesis Data Analytics to analyze the data" is incorrect. Kinesis is a real-time streaming data service. It is not a columnar database so is unsuitable for this use case.

INCORRECT: "Create an AWS Lambda function that copies the data onto Amazon S3. Use Amazon S3 Select to query the data" is incorrect. S3 is not a columnar database and S3 select does not run analytics queries, it simply selects data from an object to retrieve.

8. Question

There has been an increase in traffic to an application that writes data to an Amazon DynamoDB database. Thousands of random tables reads occur per second and low-latency is required. What can a Solutions Architect do to improve performance for the reads without negatively impacting the rest of the application?

1: Increase the number of Amazon DynamoDB write capacity units

2: Add an Amazon SQS queue to decouple the requests

3: Use Amazon DynamoDB Accelerator to cache the reads

4: Use an Amazon Kinesis Data Stream to decouple requests

Answer: 3

Explanation:

DAX is a DynamoDB-compatible caching service that enables you to benefit from fast in-memory performance for demanding applications. DAX addresses three core scenarios:

- As an in-memory cache, DAX reduces the response times of eventually consistent read workloads by an order of magnitude from single-digit milliseconds to microseconds.

- DAX reduces operational and application complexity by providing a managed service that is API-compatible with DynamoDB. Therefore, it requires only minimal functional changes to use with an existing application.
- For read-heavy or bursty workloads, DAX provides increased throughput and potential operational cost savings by reducing the need to overprovision read capacity units. This is especially beneficial for applications that require repeated reads for individual keys.

DynamoDB accelerator is the best solution for caching the reads and delivering them at extremely low latency.

CORRECT: "Use Amazon DynamoDB Accelerator to cache the reads" is the correct answer.

INCORRECT: "Increase the number of Amazon DynamoDB write capacity units" is incorrect. This will not improve read performance as write capacity units affect write performance.

INCORRECT: "Add an Amazon SQS queue to decouple the requests" is incorrect. You cannot decouple a database from the frontend with a queue in order to decrease read latency.

INCORRECT: "Use an Amazon Kinesis Data Stream to decouple requests" is incorrect. You cannot increase read performance for a database by implementing a real-time streaming service.

9. Question

A Solutions Architect must enable an application to download software updates from the internet. The application runs on a series of EC2 instances in an Auto Scaling group running in a private subnet. The solution must involve minimal ongoing systems management effort. How should the Solutions Architect proceed?

1: Implement a NAT gateway

2: Launch a NAT instance

3: Create a Virtual Private Gateway

4: Attach Elastic IP addresses

Answer: 1

Explanation:

Both a NAT gateway or a NAT instance can be used for this use case. Both services enable internet access for instances in private subnets. However, the NAT instance runs on an EC2 instance you must launch, configure and manage and therefore involves more ongoing systems management effort.

CORRECT: "Implement a NAT gateway" is the correct answer.

INCORRECT: "Launch a NAT instance" is incorrect as this service involves more ongoing systems management effort.

INCORRECT: "Create a Virtual Private Gateway" is incorrect. A VPG is used as part of a VPN connection (AWS side of the connection). It is not used to enable internet access.

INCORRECT: "Attach Elastic IP addresses" is incorrect. You cannot use Elastic IP addresses with instances in private subnets.

10. Question

A Solutions Architect manages multiple Amazon RDS MySQL databases. To improve security, the Solutions Architect wants to enable secure user access with short-lived credentials. How can these requirements be met?

1: Configure the MySQL databases to use the AWS Security Token Service (STS)

2: Configure the application to use the AUTH command to send a unique password

3: Create the MySQL user accounts to use the AWSAuthenticationPlugin with IAM

4: Configure the MySQL databases to use AWS KMS data encryption keys

Answer: 3

Explanation:

With MySQL, authentication is handled by AWSAuthenticationPlugin—an AWS-provided plugin that works seamlessly with IAM to authenticate your IAM users. Connect to the DB instance and issue the CREATE USER statement, as shown in the following example.

CREATE USER jane_doe IDENTIFIED WITH AWSAuthenticationPlugin AS 'RDS';

The IDENTIFIED WITH clause allows MySQL to use the AWSAuthenticationPlugin to authenticate the database account (jane_doe). The AS 'RDS' clause refers to the authentication method, and the specified database account should have the same name as the IAM user or role. In this example, both the database account and the IAM user or role are named jane_doe.

CORRECT: "Create the MySQL user accounts to use the AWSAuthenticationPlugin with IAM" is the correct answer.

INCORRECT: "Configure the MySQL databases to use the AWS Security Token Service (STS)" is incorrect. You cannot configure MySQL to directly use the AWS STS.

INCORRECT: "Configure the application to use the AUTH command to send a unique password" is incorrect. This is used with Redis databases, not with RDS databases.

INCORRECT: "Configure the MySQL databases to use AWS KMS data encryption keys" is incorrect. Data encryption keys are used for data encryption not management of connections strings.

11. Question

An application running a private subnet of an Amazon VPC must have outbound internet access for downloading updates. The Solutions Architect does not want the application exposed to inbound connection attempts. Which steps should be taken?

1: Create a NAT gateway but do not create attach an internet gateway to the VPC

2: Attach an internet gateway to the private subnet and create a NAT gateway

3: Attach an internet gateway to the VPC but do not create a NAT gateway

4: Create a NAT gateway and attach an internet gateway to the VPC

Answer: 4

Explanation:

To enable outbound connectivity for instances in private subnets a NAT gateway can be created. The NAT gateway is created in a public subnet and a route must be created in the private subnet pointing to the NAT gateway

for internet-bound traffic. An internet gateway must be attached to the VPC to facilitate outbound connections.

You cannot directly connect to an instance in a private subnet from the internet. You would need to use a bastion/jump host. Therefore, the application will not be exposed to inbound connection attempts.

CORRECT: "Create a NAT gateway and attach an internet gateway to the VPC" is the correct answer.

INCORRECT: "Create a NAT gateway but do not create attach an internet gateway to the VPC" is incorrect. An internet gateway must be attached to the VPC for any outbound connections to work.

INCORRECT: "Attach an internet gateway to the private subnet and create a NAT gateway" is incorrect. You do not attach internet gateways to subnets, you attach them to VPCs.

INCORRECT: "Attach an internet gateway to the VPC but do not create a NAT gateway" is incorrect. Without a NAT gateway the instances in the private subnet will not be able to download updates from the internet.

12. Question

An application has been migrated from on-premises to an Amazon EC2 instance. The migration has failed to an unknown dependency that the application must communicate with an on-premises server using private IP addresses.

Which action should a solutions architect take to quickly provision the necessary connectivity?

1. Question

1: Setup an AWS Direct Connect connection

2: Configure a Virtual Private Gateway

3: Create an Amazon CloudFront distribution

4: Create an AWS Transit Gateway

Answer: 2

Explanation:

A virtual private gateway is a logical, fully redundant distributed edge routing function that sits at the edge of your VPC. You must create a VPG in your VPC before you can establish an AWS Managed site-to-site VPN

connection. The other end of the connection is the customer gateway which must be established on the customer side of the connection.

CORRECT: "Configure a Virtual Private Gateway" is the correct answer.

INCORRECT: "Setup an AWS Direct Connect connection" is incorrect as this would take too long to provision.

INCORRECT: "Create an Amazon CloudFront distribution" is incorrect. This is not a solution for enabling connectivity using private addresses to an on-premises site. CloudFront is a content delivery network (CDN).

INCORRECT: "Create an AWS Transit Gateway" is incorrect. AWS Transit Gateway connects VPCs and on-premises networks through a central hub which is not a requirement of this solution.

13. Question

A company runs an API on a Linux server in their on-premises data center. The company are planning to migrate the API to the AWS cloud. The company require a highly available, scalable and cost-effective solution. What should a Solutions Architect recommend?

1: Migrate the API to Amazon API Gateway and migrate the backend to Amazon EC2

2: Migrate the API server to Amazon EC2 instances in an Auto Scaling group and attach an Application Load Balancer

3: Migrate the API to Amazon API Gateway and use AWS Lambda as the backend

4: Migrate the API to Amazon CloudFront and use AWS Lambda as the origin

Answer: 3

Explanation:

The best option is to use a fully serverless solution. This will provide high availability, scalability and be cost-effective. The components for this would be Amazon API Gateway for hosting the API and AWS Lambda for running the backend.

API Gateway can be the frontend for multiple backend services.

CORRECT: "Migrate the API to Amazon API Gateway and use AWS Lambda as the backend" is the correct answer.

INCORRECT: "Migrate the API to Amazon API Gateway and migrate the backend to Amazon EC2" is incorrect. This is a less available and cost-effective solution for the backend compared to AWS Lambda.

INCORRECT: "Migrate the API server to Amazon EC2 instances in an Auto Scaling group and attach an Application Load Balancer" is incorrect. Firstly, it may be difficult to load balance to an API. Additionally, this is a less cost-effective solution.

INCORRECT: "Migrate the API to Amazon CloudFront and use AWS Lambda as the origin" is incorrect. You cannot migrate an API to CloudFront. You can use CloudFront in front of API Gateway but that is not what this answer specifies.

14. Question

An application that is being installed on an Amazon EC2 instance requires a persistent block storage volume. The data must be encrypted at rest and regular volume-level backups must be automated.

Which solution options should be used?

1: Use an encrypted Amazon EBS volume and use Data Lifecycle Manager to automate snapshots

2: Use an encrypted Amazon EFS filesystem and use an Amazon CloudWatch Events rule to start a backup copy of data using AWS Lambda

3: Use server-side encryption on an Amazon S3 bucket and use Cross-Region-Replication to backup on a schedule

4: Use an encrypted Amazon EC2 instance store and copy the data to another EC2 instance using a cron job and a batch script

Answer: 1

Explanation:

For block storage the Solutions Architect should use either Amazon EBS or EC2 instance store. However, the instance store is non-persistent so EBS must be used. With EBS you can encrypt your volume and automate volume-level backups using snapshots that are run by Data Lifecycle Manager.

CORRECT: "Use an encrypted Amazon EBS volume and use Data Lifecycle Manager to automate snapshots" is the correct answer.

INCORRECT: "Use an encrypted Amazon EFS filesystem and use an Amazon CloudWatch Events rule to start a backup copy of data using AWS Lambda" is incorrect. EFS is not block storage, it is a file-level storage service.

INCORRECT: "Use server-side encryption on an Amazon S3 bucket and use Cross-Region-Replication to backup on a schedule" is incorrect. Amazon S3 is an object-based storage system not a block-based storage system.

INCORRECT: "Use an encrypted Amazon EC2 instance store and copy the data to another EC2 instance using a cron job and a batch script " is incorrect as the EC2 instance store is a non-persistent volume.

15. Question

A company has several AWS accounts each with multiple Amazon VPCs. The company must establish routing between all private subnets. The architecture should be simple and allow transitive routing to occur.

How should the network connectivity be configured?

1: Create a transitive VPC peering connection between each Amazon VPC and configure route tables

2: Create an AWS Transit Gateway and share it with each account using AWS Resource Access Manager

3: Create an AWS Managed VPN between each Amazon VPC and configure route tables

4: Create a hub-and-spoke topology with AWS App Mesh and use AWS Resource Access Manager to share route tables

Answer: 2

Explanation:

You can build a hub-and-spoke topology with AWS Transit Gateway that supports transitive routing. This simplifies the network topology and adds additional features over VPC peering. AWS Resource Access Manager can be used to share the connection with the other AWS accounts.

CORRECT: "Create an AWS Transit Gateway and share it with each account using AWS Resource Access Manager" is the correct answer.

INCORRECT: "Create a transitive VPC peering connection between each Amazon VPC and configure route tables" is incorrect. You cannot create transitive connections with VPC peering.

INCORRECT: "Create an AWS Managed VPN between each Amazon VPC and configure route tables" is incorrect. This is a much more complex solution compared to AWS Transit Gateway so is not the best option.

INCORRECT: "Create a hub-and-spoke topology with AWS App Mesh and use AWS Resource Access Manager to share route tables" is incorrect. AWS App Mesh is used for application-level networking for microservices applications.

16. Question

An organization is planning their disaster recovery solution. They would like to keep their core business critical systems running in the cloud. Other services can be replicated but switched off.

Which DR strategy should a Solutions Architect recommend?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

Answer: 3

Explanation:

The term warm standby is used to describe a DR scenario in which a scaled-down version of a fully functional environment is always running in the cloud. A warm standby solution extends the pilot light elements and preparation.

It further decreases the recovery time because some services are always running. By identifying your business-critical systems, you can fully duplicate these systems on AWS and have them always on.

CORRECT: "Warm standby" is the correct answer.

INCORRECT: "Backup and restore" is incorrect. This is the lowest cost DR approach that simply entails creating online backups of all data and applications.

INCORRECT: Pilot light"" is incorrect. With a pilot light strategy a core minimum of services are running and the remainder are only brought online during a disaster recovery situation.

INCORRECT: "Multi-site" is incorrect. A multi-site solution runs on AWS as well as on your existing on-site infrastructure in an active- active configuration.

17. Question

An application analyzes images of people that are uploaded to an Amazon S3 bucket. The application determines demographic data which is then saved to a .CSV file in another S3 bucket. The data must be encrypted at rest and then queried using SQL. The solution should be fully serverless.

Which actions should a Solutions Architect take to encrypt and query the data?

1: Use Amazon S3 server-side encryption and use Amazon RedShift Spectrum to query the data

2: Use AWS KMS encryption keys for the S3 bucket and use Amazon Athena to query the data

3: Use AWS KMS encryption keys for the S3 bucket and use Amazon Kinesis Data Analytics to query the data

4: Use Amazon S3 server-side encryption and Amazon QuickSight to query the data

Answer: 2

Explanation:

Amazon Athena is an interactive query service that makes it easy to analyze data in Amazon S3 using standard SQL. Athena is serverless, so there is no infrastructure to manage, and you pay only for the queries that you run. Amazon Athena supports encrypted data for both the source data and query results, for example, using Amazon S3 with AWS KMS.

CORRECT: "Use AWS KMS encryption keys for the S3 bucket and use Amazon Athena to query the data" is the correct answer.

INCORRECT: "Use Amazon S3 server-side encryption and use Amazon RedShift Spectrum to query the data" is incorrect. RedShift Spectrum is not

serverless as it requires a RedShift cluster which is based on EC2 instances.

INCORRECT: "Use AWS KMS encryption keys for the S3 bucket and use Amazon Kinesis Data Analytics to query the data" is incorrect. Kinesis Data Analytics is used for analyzing real-time streaming data in Kinesis streams.

INCORRECT: "Use Amazon S3 server-side encryption and Amazon QuickSight to query the data" is incorrect. Amazon QuickSight is an interactive dashboard, it is not a service for running queries on data.

18. Question

A large quantity of data is stored on a NAS device on-premises and accessed using the SMB protocol. The company require a managed service for hosting the filesystem and a tool to automate the migration. Which actions should a Solutions Architect take?

1: Migrate the data to Amazon EFS using the AWS Server Migration Service (SMS)

2: Migrate the data to Amazon FSx for Lustre using AWS DataSync

3: Migrate the data to Amazon FSx for Windows File Server using AWS DataSync

4: Migrate the data to Amazon S3 using and AWS Snowball Edge device

Answer: 3

Explanation:

Amazon FSx for Windows File Server provides fully managed, highly reliable, and scalable file storage that is accessible over the industry-standard Server Message Block (SMB) protocol. This is the most suitable destination for this use case.

AWS DataSync can be used to move large amounts of data online between on-premises storage and Amazon S3, Amazon EFS, or Amazon FSx for Windows File Server. The source datastore can be Server Message Block (SMB) file servers.

CORRECT: "Migrate the data to Amazon FSx for Windows File Server using AWS DataSync" is the correct answer.

INCORRECT: "Migrate the data to Amazon EFS using the AWS Server Migration Service (SMS)" is incorrect. EFS is used for hosting filesystems

accessed over NFS from Linux (not Windows). The SMS service is used for migrating virtual machines, not data.

INCORRECT: "Migrate the data to Amazon FSx for Lustre using AWS DataSync" is incorrect. Amazon FSx for Windows File Server should be used for hosting SMB shares.

INCORRECT: "Migrate the data to Amazon S3 using and AWS Snowball Edge device" is incorrect. Amazon S3 is an object store and unsuitable for hosting an SMB filesystem. Snowball is not required in this case as the data is not going to S3 and there are no time or bandwidth limitations mentioned in the scenario.

19. Question

The database layer of an on-premises web application is being migrated to AWS. The database uses a multi-threaded, in-memory caching layer to improve performance for repeated queries. Which service would be the most suitable replacement for the database cache?

1: Amazon ElastiCache Redis

2: Amazon DynamoDB DAX

3: Amazon ElastiCache Memcached

4: Amazon RDS MySQL

Answer: 3

Explanation:

Amazon ElastiCache with the Memcached engine is an in-memory database that can be used as a database caching layer. The memached engine supports multiple cores and threads and large nodes.

CORRECT: "Amazon ElastiCache Memcached" is the correct answer.

INCORRECT: "Amazon ElastiCache Redis" is incorrect. The Redis engine does not support multiple CPU cores or threads.

INCORRECT: "Amazon DynamoDB DAX" is incorrect. Amazon DynamoDB Accelerator (DAX) is a database cache that should be used with DynamoDB only.

INCORRECT: "Amazon RDS MySQL" is incorrect as this is not an example of an in-memory database that can be used as a database caching layer.

20. Question

A Solutions Architect is designing an application for processing and extracting data from log files. The log files are generated by an application and the number and frequency of updates varies. The files are up to 1 GB in size and processing will take around 40 seconds for each file.

Which solution is the most cost-effective?

1: Write the log files to an Amazon EC2 instance with an attached EBS volume. After processing, save the files to an Amazon S3 bucket

2: Write the log files to an Amazon SQS queue. Use AWS Lambda to process the files from the queue and save to an Amazon S3 bucket

3: Write the log files to an Amazon S3 bucket. Create an event notification to invoke an Amazon ECS task to process the files and save to an Amazon S3 bucket

4: Write the log files to an Amazon S3 bucket. Create an event notification to invoke an AWS Lambda function that will process the files

Answer: 4

Explanation:

The question asks for the most cost-effective solution and therefor a serverless and automated solution will be the best choice.

AWS Lambda can run custom code in response to Amazon S3 bucket events. You upload your custom code to AWS Lambda and create a function. When Amazon S3 detects an event of a specific type (for example, an object created event), it can publish the event to AWS Lambda and invoke your function in Lambda. In response, AWS Lambda executes your function.

CORRECT: "Write the log files to an Amazon S3 bucket. Create an event notification to invoke an AWS Lambda function that will process the files" is the correct answer.

INCORRECT: "Write the log files to an Amazon EC2 instance with an attached EBS volume. After processing, save the files to an Amazon S3 bucket" is incorrect. This is not cost effective as it is not serverless.

INCORRECT: "Write the log files to an Amazon SQS queue. Use AWS Lambda to process the files from the queue and save to an Amazon S3 bucket" is incorrect. SQS has a maximum message size of 256 KB so the message body would need to be saved in S3 anyway. Using an event source mapping from S3 would be less complex and preferable.

INCORRECT: "Write the log files to an Amazon S3 bucket. Create an event notification to invoke an Amazon ECS task to process the files and save to an Amazon S3 bucket" is incorrect. You cannot use event notifications to process Amazon ECS tasks.

21. Question

A large multinational retail company has a presence in AWS in multiple regions. The company has established a new office and needs to implement a high-bandwidth, low-latency connection to multiple VPCs in multiple regions within the same account. The VPCs each have unique CIDR ranges.

What would be the optimum solution design using AWS technology? (Select TWO)

1: Configure AWS VPN CloudHub

2: Create a Direct Connect gateway, and create private VIFs to each region

3: Provision an MPLS network

4: Implement Direct Connect connections to each AWS region

5: Implement a Direct Connect connection to the closest AWS region

Answer: 2,5

Explanation:

The company should implement an AWS Direct Connect connection to the closest region. A Direct Connect gateway can then be used to create private virtual interfaces (VIFs) to each AWS region.

Direct Connect gateway provides a grouping of Virtual Private Gateways (VGWs) and Private Virtual Interfaces (VIFs) that belong to the same AWS account and enables you to interface with VPCs in any AWS Region (except AWS China Region).

You can share a private virtual interface to interface with more than one Virtual Private Cloud (VPC) reducing the number of BGP sessions

required.

CORRECT: "Create a Direct Connect gateway, and create private VIFs to each region" is a correct answer.

CORRECT: "Implement a Direct Connect connection to the closest AWS region" is also a correct answer.

INCORRECT: "Configure AWS VPN CloudHub" is incorrect. AWS VPN CloudHub is not the best solution as you have been asked to implement high-bandwidth, low-latency connections and VPN uses the Internet so is not reliable.

INCORRECT: "Provision an MPLS network" is incorrect. An MPLS network could be used to create a network topology that gets you closer to AWS in each region but you would still need use Direct Connect or VPN for the connectivity into AWS. Also, the question states that you should use AWS technology and MPLS is not offered as a service by AWS.

INCORRECT: "Implement Direct Connect connections to each AWS region" is incorrect. You do not need to implement multiple Direct Connect connections to each region. This would be a more expensive option as you would need to pay for an international private connection.

22. Question

A Solutions Architect is creating a design for a two-tier application with a MySQL RDS back-end. The performance requirements of the database tier are hard to quantify until the application is running and the Architect is concerned about right-sizing the database.

What methods of scaling are possible after the MySQL RDS database is deployed? (Select TWO)

1: Vertical scaling for read and write by choosing a larger instance size

2: Horizontal scaling for write capacity by enabling Multi-AZ

3: Vertical scaling for read and write by using Transfer Acceleration

4: Horizontal scaling for read and write by enabling Multi-Master RDS DB

5: Horizontal scaling for read capacity by creating a read-replica

Answer: 1,5

Explanation:

To handle a higher load in your database, you can vertically scale up your master database with a simple push of a button. In addition to scaling your master database vertically, you can also improve the performance of a read-heavy database by using read replicas to horizontally scale your database.

CORRECT: "Vertical scaling for read and write by choosing a larger instance size" is a correct answer.

CORRECT: "Horizontal scaling for read capacity by creating a read-replica" is also a correct answer.

INCORRECT: "Horizontal scaling for write capacity by enabling Multi-AZ" is incorrect. You cannot scale write capacity by enabling Multi-AZ as only one DB is active and can be written to.

INCORRECT: "Vertical scaling for read and write by using Transfer Acceleration" is incorrect. Transfer Acceleration is a feature of S3 for fast uploads of objects.

INCORRECT: "Horizontal scaling for read and write by enabling Multi-Master RDS DB" is incorrect. There is no such thing as a Multi-Master MySQL RDS DB (there is for Aurora).

23. Question

An application is running on EC2 instances in a private subnet of an Amazon VPC. A Solutions Architect would like to connect the application to Amazon API Gateway. For security reasons, it is necessary to ensure that no traffic traverses the Internet and to ensure all traffic uses private IP addresses only.

How can this be achieved?

1: Create a NAT gateway

2: Create a public VIF on a Direct Connect connection

3: Create a private API using an interface VPC endpoint

4: Add the API gateway to the subnet the EC2 instances are located in

Answer: 3

Explanation:

An Interface endpoint uses AWS PrivateLink and is an elastic network interface (ENI) with a private IP address that serves as an entry point for traffic destined to a supported service. Using PrivateLink you can connect

your VPC to supported AWS services, services hosted by other AWS accounts (VPC endpoint services), and supported AWS Marketplace partner services.

CORRECT: "Create a private API using an interface VPC endpoint" is the correct answer.

INCORRECT: "Create a NAT gateway" is incorrect. NAT Gateways are used to provide Internet access for EC2 instances in private subnets so are of no use in this solution.

INCORRECT: "Create a public VIF on a Direct Connect connection" is incorrect. You do not need to implement Direct Connect and create a public VIF. Public IP addresses are used in public VIFs and the question requests that only private addresses are used.

INCORRECT: "Add the API gateway to the subnet the EC2 instances are located in" is incorrect. You cannot add API Gateway to the subnet the EC2 instances are in, it is a public service with a public endpoint.

24. Question

An application stack is being created which needs a message bus to decouple the application components from each other. The application will generate up to 300 messages per second without using batching. A Solutions Architect needs to ensure that a message is delivered only once and duplicates are not introduced into the queue. It is not necessary to maintain the order of the messages.

Which SQS queue type should be used?

1: Standard queues

2: Long polling queues

3: FIFO queues

4: Auto Scaling queues

Answer: 3

Explanation:

The key fact you need to consider here is that duplicate messages cannot be introduced into the queue. For this reason alone you must use a FIFO queue. The statement about it not being necessary to maintain the order of the messages is meant to confuse you, as that might lead you to think you

can use a standard queue, but standard queues don't guarantee that duplicates are not introduced into the queue.

FIFO (first-in-first-out) queues preserve the exact order in which messages are sent and received – note that this is not required in the question but exactly once processing is. FIFO queues provide exactly-once processing, which means that each message is delivered once and remains available until a consumer processes it and deletes it.

CORRECT: "FIFO queues" is the correct answer.

INCORRECT: "Standard queues" is incorrect. Standard queues provide a loose-FIFO capability that attempts to preserve the order of messages. Standard queues provide at-least-once delivery, which means that each message is delivered at least once.

INCORRECT: "Long polling queues" is incorrect. Long polling is configuration you can apply to a queue, it is not a queue type.

INCORRECT: "Auto Scaling queues" is incorrect. There is no such thing as an Auto Scaling queue.

25. Question

A Solutions Architect is attempting to clean up unused EBS volumes and snapshots to save some space and cost. How many of the most recent snapshots of an EBS volume need to be maintained to guarantee that you can recreate the full EBS volume from the snapshot?

1: You must retain all snapshots as the process is incremental and therefore data is required from each snapshot

2: Two snapshots, the oldest and most recent snapshots

3: The oldest snapshot, as this references data in all other snapshots

4: Only the most recent snapshot. Snapshots are incremental, but the deletion process will ensure that no data is lost

Answer: 4

Explanation:

Snapshots capture a point-in-time state of an instance. If you make periodic snapshots of a volume, the snapshots are incremental, which means that only the blocks on the device that have changed after your last snapshot are saved in the new snapshot.

Even though snapshots are saved incrementally, the snapshot deletion process is designed so that you need to retain only the most recent snapshot in order to restore the volume.

CORRECT: "Only the most recent snapshot. Snapshots are incremental, but the deletion process will ensure that no data is lost" is the correct answer.

INCORRECT: "You must retain all snapshots as the process is incremental and therefore data is required from each snapshot" is incorrect as explained above.

INCORRECT: "Two snapshots, the oldest and most recent snapshots" is incorrect as explained above.

INCORRECT: "The oldest snapshot, as this references data in all other snapshots" is incorrect as explained above.

26. Question

A Python application is currently running on Amazon ECS containers using the Fargate launch type. An ALB has been created with a Target Group that routes incoming connections to the ECS-based application. The application will be used by consumers who will authenticate using federated OIDC compliant Identity Providers such as Google and Facebook. The users must be securely authenticated on the front-end before they access the secured portions of the application.

How can this be configured using an ALB?

1: The only option is to use SAML with Amazon Cognito on the ALB

2: This can be done on the ALB by creating an authentication action on a listener rule that configures an Amazon Cognito user pool with the social IdP

3: This cannot be done on an ALB; you'll need to authenticate users on the back-end with AWS Single Sign-On (SSO) integration

4: This cannot be done on an ALB; you'll need to use another layer in front of the ALB

Answer: 2

Explanation:

ALB supports authentication from OIDC compliant identity providers such as Google, Facebook and Amazon. It is implemented through an authentication action on a listener rule that integrates with Amazon Cognito to create user pools.

SAML can be used with Amazon Cognito but this is not the only option.

CORRECT: "This can be done on the ALB by creating an authentication action on a listener rule that configures an Amazon Cognito user pool with the social IdP" is the correct answer.

INCORRECT: "The only option is to use SAML with Amazon Cognito on the ALB" is incorrect as explained above.

INCORRECT: "This cannot be done on an ALB; you'll need to authenticate users on the back-end with AWS Single Sign-On (SSO) integration" is incorrect as explained above.

INCORRECT: "This cannot be done on an ALB; you'll need to use another layer in front of the ALB" is incorrect as explained above.

27. Question

A Solutions Architect is creating a solution for an application that must be deployed on Amazon EC2 hosts that are dedicated to the client. Instance placement must be automatic and billing should be per instance.

Which type of EC2 deployment model should be used?

1: Reserved Instance

2: Dedicated Instance

3: Dedicated Host

4: Cluster Placement Group

Answer: 2

Explanation:

Dedicated Instances are Amazon EC2 instances that run in a VPC on hardware that's dedicated to a single customer. Your Dedicated instances are physically isolated at the host hardware level from instances that belong to other AWS accounts. Dedicated instances allow automatic instance placement and billing is per instance.

CORRECT: "Dedicated Instance" is the correct answer.

INCORRECT: "Reserved Instance" is incorrect. Reserved instances are a method of reducing cost by committing to a fixed contract term of 1 or 3 years..

INCORRECT: "Dedicated Host" is incorrect. An Amazon EC2 Dedicated Host is a physical server with EC2 instance capacity fully dedicated to your use. Dedicated Hosts can help you address compliance requirements and reduce costs by allowing you to use your existing server-bound software licenses. With dedicated hosts billing is on a per-host basis (not per instance).

INCORRECT: "Cluster Placement Group" is incorrect. A Cluster Placement Group determines how instances are placed on underlying hardware to enable low-latency connectivity.

28. Question

There is new requirement for a database that will store a large number of records for an online store. You are evaluating the use of DynamoDB. Which of the following are AWS best practices for DynamoDB? (Select TWO)

1: Use separate local secondary indexes for each item

2: Store objects larger than 400KB in S3 and use pointers in DynamoDB

3: Store more frequently and less frequently accessed data in separate tables

4: Use for BLOB data use cases

5: Use large files

Answer: 2,3

Explanation:

DynamoDB best practices include:

- Keep item sizes small.
- If you are storing serial data in DynamoDB that will require actions based on data/time use separate tables for days, weeks, months.
- Store more frequently and less frequently accessed data in separate tables.
- If possible compress larger attribute values.
- Store objects larger than 400KB in S3 and use pointers (S3 Object ID) in DynamoDB.

CORRECT: "Store objects larger than 400KB in S3 and use pointers in DynamoDB" is the correct answer.

CORRECT: "Store more frequently and less frequently accessed data in separate tables" is the correct answer.

INCORRECT: "Use separate local secondary indexes for each item" is incorrect as this is not a best practice.

INCORRECT: "Use for BLOB data use cases" is incorrect as this is not a best practice.

INCORRECT: "Use large files" is incorrect as this is not a best practice.

29. Question

A Solutions Architect needs to migrate an Oracle database running on RDS onto Amazon RedShift to improve performance and reduce cost. What combination of tasks using AWS services should be followed to execute the migration? (Select TWO)

1: Migrate the database using the AWS Database Migration Service (DMS)

2: Convert the schema using the AWS Schema Conversion Tool

3: Take a snapshot of the Oracle database and restore the snapshot onto RedShift

4: Configure API Gateway to extract, transform and load the data into RedShift

5: Enable log shipping from the Oracle database to RedShift

Answer: 1,2

Explanation:

Convert the data warehouse schema and code from the Oracle database running on RDS using the AWS Schema Conversion Tool (AWS SCT) then migrate data from the Oracle database to Amazon Redshift using the AWS Database Migration Service (AWS DMS)

CORRECT: "Migrate the database using the AWS Database Migration Service (DMS)" is the correct answer.

CORRECT: "Convert the schema using the AWS Schema Conversion Tool" is the correct answer.

INCORRECT: "Take a snapshot of the Oracle database and restore the snapshot onto RedShift" is incorrect. Snapshots are not a supported

migration method from RDS to RedShift.

INCORRECT: "Configure API Gateway to extract, transform and load the data into RedShift" is incorrect. API Gateway is not used for ETL functions.

INCORRECT: "Enable log shipping from the Oracle database to RedShift" is incorrect. Log shipping is not a supported migration method from RDS to RedShift.

30. Question

A client has made some updates to their web application. The application uses an Auto Scaling Group to maintain a group of several EC2 instances. The application has been modified and a new AMI must be used for launching any new instances.

What does a Solutions Architect need to do to add the new AMI?

1: Create a new target group that uses a new launch configuration with the new AMI

2: Modify the existing launch configuration to add the new AMI

3: Suspend Auto Scaling and replace the existing AMI

4: Create a new launch configuration that uses the AMI and update the ASG to use the new launch configuration

Answer: 4

Explanation:

A launch configuration is the template used to create new EC2 instances and includes parameters such as instance family, instance type, AMI, key pair and security groups.

You cannot edit a launch configuration once defined. In this case you can create a new launch configuration that uses the new AMI and any new instances that are launched by the ASG will use the new AMI.

CORRECT: "Create a new launch configuration that uses the AMI and update the ASG to use the new launch configuration" is the correct answer.

INCORRECT: "Create a new target group that uses a new launch configuration with the new AMI" is incorrect. A target group is a concept associated with an ELB not Auto Scaling.

INCORRECT: "Modify the existing launch configuration to add the new AMI" is incorrect as you cannot modify an existing launch configuration.

INCORRECT: "Suspend Auto Scaling and replace the existing AMI" is incorrect. Suspending scaling processes can be useful when you want to investigate a configuration problem or other issue with your web application and then make changes to your application, without invoking the scaling processes. It is not useful in this situation.

31. Question

A Solutions Architect regularly deploys and manages infrastructure services for customers on AWS. The SysOps team are facing challenges in tracking changes that are made to the infrastructure services and rolling back when problems occur.

How can a Solutions Architect BEST assist the SysOps team?

1: Use AWS Systems Manager to manage all updates to the infrastructure services

2: Use CodeDeploy to manage version control for the infrastructure services

3: Use CloudFormation templates to deploy and manage the infrastructure services

4: Use Trusted Advisor to record updates made to the infrastructure services

Answer: 3

Explanation:

When you provision your infrastructure with AWS CloudFormation, the AWS CloudFormation template describes exactly what resources are provisioned and their settings. Because these templates are text files, you simply track differences in your templates to track changes to your infrastructure, similar to the way developers control revisions to source code.

For example, you can use a version control system with your templates so that you know exactly what changes were made, who made them, and when. If at any point you need to reverse changes to your infrastructure, you can use a previous version of your template.

CORRECT: "Use CloudFormation templates to deploy and manage the infrastructure services" is the correct answer.

INCORRECT: "Use AWS Systems Manager to manage all updates to the infrastructure services" is incorrect. AWS Systems Manager gives you visibility and control of your infrastructure on AWS. Systems Manager provides a unified user interface so you can view operational data from multiple AWS services and allows you to automate operational tasks across your AWS resources. However, CloudFormation would be the preferred method of maintaining the state of the overall architecture.

INCORRECT: "Use CodeDeploy to manage version control for the infrastructure services" is incorrect. AWS CodeDeploy is a deployment service that automates application (not infrastructure) deployments to Amazon EC2 instances, on-premises instances, or serverless Lambda functions. This would be a good fit if we were talking about an application environment where code changes need to be managed but not for infrastructure services..

INCORRECT: "Use Trusted Advisor to record updates made to the infrastructure services" is incorrect. AWS Trusted Advisor is an online resource to help you reduce cost, increase performance, and improve security by optimizing your AWS environment, Trusted Advisor provides real time guidance to help you provision your resources following AWS best practices.

32. Question

A Solutions Architect is designing the compute layer of a serverless application. The compute layer will manage requests from external systems, orchestrate serverless workflows, and execute the business logic.

The Architect needs to select the most appropriate AWS services for these functions. Which services should be used for the compute layer? (Select TWO)

1: Use Amazon ECS for executing the business logic

2: Use AWS CloudFormation for orchestrating serverless workflows

3: Use AWS Step Functions for orchestrating serverless workflows

4: Use AWS Elastic Beanstalk for executing the business logic

5: Use Amazon API Gateway with AWS Lambda for executing the business logic

Answer: 3,5

Explanation:

With Amazon API Gateway, you can run a fully managed REST API that integrates with Lambda to execute your business logic and includes traffic management, authorization and access control, monitoring, and API versioning.

AWS Step Functions orchestrates serverless workflows including coordination, state, and function chaining as well as combining long-running executions not supported within Lambda execution limits by breaking into multiple steps or by calling workers running on Amazon Elastic Compute Cloud (Amazon EC2) instances or on-premises.

CORRECT: "Use AWS Step Functions for orchestrating serverless workflows" is the correct answer.

CORRECT: "Use Amazon API Gateway with AWS Lambda for executing the business logics" is the correct answer.

INCORRECT: "Use Amazon ECS for executing the business logic" is incorrect. The Amazon Elastic Container Service (ECS) is not a serverless application stack, containers run on EC2 instances.

INCORRECT: "Use AWS CloudFormation for orchestrating serverless workflows" is incorrect. AWS CloudFormation is used for describing and provisioning resources not actually performing workflow functions within the application.

INCORRECT: "Use AWS Elastic Beanstalk for executing the business logic" is incorrect. AWS Elastic Beanstalk is used for describing and provisioning resources not actually performing workflow functions within the application.

33. Question

An application running in an on-premise data center writes data to a MySQL database. A Solutions Architect is re-architecting the application and plans to move the database layer into the AWS cloud on Amazon RDS. The application layer will run in the on-premise data center.

What must be done to connect the application to the RDS database via the Internet? (Select TWO)

1: Configure a NAT Gateway and attach the RDS database

2: Choose to make the RDS instance publicly accessible and place it in a public subnet

3: Select a public IP within the DB subnet group to assign to the RDS instance

4: Create a security group allowing access from the on-premise public IP to the RDS instance and assign to the RDS instance

5: Create a DB subnet group that is publicly accessible

Answer: 2,4

Explanation:

When you create the RDS instance, you need to select the option to make it publicly accessible. A security group will need to be created and assigned to the RDS instance to allow access from the public IP address of your application (or firewall).

CORRECT: "Choose to make the RDS instance publicly accessible and place it in a public subnet" is a correct answer.

CORRECT: "Create a security group allowing access from the on-premise public IP to the RDS instance and assign to the RDS instance" is also a correct answer.

INCORRECT: "Configure a NAT Gateway and attach the RDS database" is incorrect. NAT Gateways are used for enabling Internet connectivity for EC2 instances in private subnets.

INCORRECT: "Select a public IP within the DB subnet group to assign to the RDS instance" is incorrect. The RDS instance does not require a public IP.

INCORRECT: "Create a DB subnet group that is publicly accessible" is incorrect. A DB subnet group is a collection of subnets (typically private) that you create in a VPC and that you then designate for your DB instance. The DB subnet group cannot be made publicly accessible, even if the subnets are public subnets, it is the RDS DB that must be configured to be publicly accessible.

34. Question

A Solutions Architect is conducting an audit and needs to query several properties of EC2 instances in a VPC. Which two methods are available for accessing and querying the properties of an EC2 instance such as instance ID, public keys and network interfaces? (Select TWO)

1: Use the EC2 Config service

2: Run the command “curl http://169.254.169.254/latest/meta-data/”

3: Download and run the Instance Metadata Query Tool

4: Run the command “curl http://169.254.169.254/latest/dynamic/instance-identity/”

5: Use the Batch command

Answer: 2,3

Explanation:

This information is stored in the instance metadata on the instance. You can access the instance metadata through a URI or by using the Instance Metadata Query tool.

The instance metadata is available at http://169.254.169.254/latest/meta-data.

The Instance Metadata Query tool allows you to query the instance metadata without having to type out the full URI or category names.

CORRECT: "Run the command “curl http://169.254.169.254/latest/meta-data/”" is a correct answer.

CORRECT: "Download and run the Instance Metadata Query Tool" is also a correct answer.

INCORRECT: "Use the EC2 Config service" is incorrect. The EC2 config is not suitable for accessing this information.

INCORRECT: "Run the command “curl http://169.254.169.254/latest/dynamic/instance-identity/”" is incorrect. The correct command is provided above.

INCORRECT: "Use the Batch command" is incorrect. The batch command is not suitable for accessing this information.

35. Question

Encrypted Amazon Elastic Block Store (EBS) volumes are attached to some Amazon EC2 instances. Which statements are correct about using encryption with Amazon EBS volumes? (Select TWO)

1: Data is only encrypted at rest

2: Encryption is supported on all Amazon EBS volume types

3: Data in transit between an instance and an encrypted volume is also encrypted

4: Volumes created from encrypted snapshots are unencrypted

5: You cannot mix encrypted with unencrypted volumes on an instance

Answer: 2,3

Explanation:

Some facts about Amazon EBS encrypted volumes and snapshots:

- All **EBS** types support encryption and all instance **families** now support encryption.
- Not all **instance** types support encryption.
- Data in transit between an instance and an encrypted volume is also encrypted (data is encrypted in trans.
- You can have encrypted an unencrypted EBS volumes attached to an instance at the same time.
- Snapshots of encrypted volumes are encrypted automatically.
- EBS volumes restored from encrypted snapshots are encrypted automatically.
- EBS volumes created from encrypted snapshots are also encrypted.

CORRECT: "Encryption is supported on all Amazon EBS volume types" is a correct answer.

CORRECT: "Data in transit between an instance and an encrypted volume is also encrypted" is also a correct answer.

INCORRECT: "Data is only encrypted at rest" is incorrect. Please refer to the facts above.

INCORRECT: "Volumes created from encrypted snapshots are unencrypted" is incorrect. Please refer to the facts above.

INCORRECT: "You cannot mix encrypted with unencrypted volumes on an instance" is incorrect. Please refer to the facts above.

36. Question

An operations team would like to be notified if an RDS database exceeds certain metric thresholds. How can a Solutions Architect automate this process for the operations team?

1: Create a CloudWatch alarm and associate an SQS queue with it that delivers a message to SES

2: Setup an RDS alarm and associate an SNS topic with it that sends an email

3: Create a CloudTrail alarm and configure a notification event to send an SMS

4: Create a CloudWatch alarm and associate an SNS topic with it that sends an email notification

Answer: 4

Explanation:

You can create a CloudWatch alarm that watches a single CloudWatch metric or the result of a math expression based on CloudWatch metrics. The alarm performs one or more actions based on the value of the metric or expression relative to a threshold over a number of time periods.

The action can be an Amazon EC2 action, an Amazon EC2 Auto Scaling action, or a notification sent to an Amazon SNS topic. SNS can be configured to send an email notification

CORRECT: "Create a CloudWatch alarm and associate an SNS topic with it that sends an email notification" is the correct answer.

INCORRECT: "Create a CloudWatch alarm and associate an SQS queue with it that delivers a message to SES" is incorrect. You cannot associate an SQS queue with a CloudWatch alarm.

INCORRECT: "Setup an RDS alarm and associate an SNS topic with it that sends an email" is incorrect. CloudWatch performs performance monitoring so you don’t setup alarms in RDS itself.

INCORRECT: "Create a CloudTrail alarm and configure a notification event to send an SMS" is incorrect. CloudTrail is used for auditing API access, not for performance monitoring.

37. Question

An Amazon VPC contains a mixture of Amazon EC2 instances in production and non-production environments. A Solutions Architect needs to devise a way to segregate access permissions to different sets of users for instances in different environments.

How can this be achieved? (Select TWO)

1: Attach an Identity Provider (IdP) and delegate access to the instances to the relevant groups

2: Create an IAM policy that grants access to any instances with the specific tag and attach to the users and groups

3: Create an IAM policy with a conditional statement that matches the environment variables

4: Add an environment variable to the instances using user data

5: Add a specific tag to the instances you want to grant the users or groups access to

Answer: 2,5

Explanation:

You can use the condition checking in IAM policies to look for a specific tag. IAM checks that the tag attached to the principal making the request matches the specified key name and value.

CORRECT: "Create an IAM policy that grants access to any instances with the specific tag and attach to the users and groups" is the correct answer.

CORRECT: "Add a specific tag to the instances you want to grant the users or groups access to" is the correct answer.

INCORRECT: "Attach an Identity Provider (IdP) and delegate access to the instances to the relevant groups" is incorrect. You cannot use an IdP for this solution.

INCORRECT: "Create an IAM policy with a conditional statement that matches the environment variables" is incorrect as the statement should be checking for the tag.

INCORRECT: "Add an environment variable to the instances using user data" is incorrect. You cannot achieve this outcome using environment variables stored in user data and conditional statements in a policy. You must use an IAM policy that grants access to instances based on the tag.

38. Question

A customer runs an application on-premise that stores large media files. The data is mounted to different servers using either the SMB or NFS protocols. The customer is having issues with scaling the storage infrastructure on-premise and is looking for a way to offload the data set into the cloud whilst retaining a local cache for frequently accessed content.

Which of the following is the best solution?

1: Use the AWS Storage Gateway File Gateway

2: Use the AWS Storage Gateway Volume Gateway in cached volume mode

3: Create a script that migrates infrequently used data to S3 using multi-part upload

4: Establish a VPN and use the Elastic File System (EFS)

Answer: 1

Explanation:

File gateway provides a virtual on-premises file server, which enables you to store and retrieve files as objects in Amazon S3. It can be used for on-premises applications, and for Amazon EC2-resident applications that need file storage in S3 for object based workloads. Used for flat files only, stored directly on S3. File gateway offers SMB or NFS-based access to data in Amazon S3 with local caching.

CORRECT: "Use the AWS Storage Gateway File Gateway" is the correct answer.

INCORRECT: "Use the AWS Storage Gateway Volume Gateway in cached volume mode" is incorrect. The AWS Storage Gateway Volume Gateway in cached volume mode is a block-based (not file-based) solution so you cannot mount the storage with the SMB or NFS protocols With Cached Volume mode – the entire dataset is stored on S3 and a cache of the most frequently accessed data is cached on-site.

INCORRECT: "Create a script that migrates infrequently used data to S3 using multi-part upload" is incorrect. Creating a script the migrates infrequently used data to S3 is possible but that data would then not be indexed on the primary filesystem so you wouldn’t have a method of

retrieving it without developing some code to pull it back from S3. This is not the best solution.

INCORRECT: "Establish a VPN and use the Elastic File System (EFS)" is incorrect. You could mount EFS over a VPN but it would not provide you a local cache of the data.

39. Question

A client has requested a design for a fault tolerant database that can failover between AZs. You have decided to use RDS in a multi-AZ configuration. What type of replication will the primary database use to replicate to the standby instance?

1: Continuous replication

2: Asynchronous replication

3: Scheduled replication

4: Synchronous replication

Answer: 4

Explanation:

Multi-AZ RDS creates a replica in another AZ and synchronously replicates to it (DR only). Multi-AZ deployments for the MySQL, MariaDB, Oracle and PostgreSQL engines utilize synchronous physical replication. Multi-AZ deployments for the SQL Server engine use synchronous logical replication (SQL Server-native Mirroring technology).

CORRECT: "Synchronous replication" is the correct answer.

INCORRECT: "Continuous replication" is incorrect. Continuous replication is not a replication type that is supported by RDS.

INCORRECT: "Asynchronous replication" is incorrect. Asynchronous replication is used by RDS for Read Replicas.

INCORRECT: "Scheduled replication" is incorrect. Scheduled replication is not a replication type that is supported by RDS.

40. Question

A Solutions Architect needs a storage solution for a fleet of Linux web application servers. The solution should provide a file system interface

and be able to support millions of files. Which AWS service should the Architect choose?

1: Amazon ElastiCache
2: Amazon EBS
3: Amazon EFS
4: Amazon S3

Answer: 3

Explanation:

The Amazon Elastic File System (EFS) is the only storage solution in the list that provides a file system interface. It also supports millions of files as requested.

CORRECT: "Amazon EFS" is the correct answer.

INCORRECT: "Amazon ElastiCache" is incorrect. Amazon ElastiCache is an in-memory caching solution for databases.

INCORRECT: "Amazon EBS" is incorrect. Amazon EBS provides a block storage interface.

INCORRECT: "Amazon S3" is incorrect. Amazon S3 is an object storage solution and does not provide a file system interface.

41. Question

A Solutions Architect is creating an application design with several components that will be publicly addressable. The Architect would like to use Alias records. Using Route 53 Alias records what targets can you specify? (Select TWO)

1: CloudFront distribution
2: ElastiCache cluster
3: EFS filesystems
4: Elastic Beanstalk environment
5: On-premise web server

Answer: 1,4

Explanation:

Alias records are used to map resource record sets in your hosted zone to Amazon Elastic Load Balancing load balancers, API Gateway custom regional APIs and edge-optimized APIs, CloudFront Distributions, AWS Elastic Beanstalk environments, Amazon S3 buckets that are configured as website endpoints, Amazon VPC interface endpoints, and to other records in the same Hosted Zone.

CORRECT: "CloudFront distribution" is the correct answer.

CORRECT: "Elastic Beanstalk environment" is the correct answer.

INCORRECT: "ElastiCache cluster" is incorrect. You cannot use an Alias to point at an ElastiCache cluster or VPC endpoint.

INCORRECT: "EFS filesystems" is incorrect. You cannot use an Alias to point to an EFS filesystem.

INCORRECT: "On-premise web server" is incorrect. You cannot point an Alias record directly at an on-premises web server (you can point to another record in a hosted zone, which could point to an on-premises web server though I'm not sure if this is supported).

42. Question

A new financial platform has been re-architected to use Docker containers in a micro-services architecture. The new architecture will be implemented on AWS and a Solutions Architect must recommend the solution configuration. For operational reasons, it will be necessary to access the operating system of the instances on which the containers run.

Which solution delivery option should the Architect select?

1: ECS with the EC2 launch type

2: EKS with Kubernetes managed infrastructure

3: ECS with the Fargate launch type

4: ECS with a default cluster

Answer: 1

Explanation:

Amazon Elastic Container Service (ECS) is a highly scalable, high performance container management service that supports Docker containers

and allows you to easily run applications on a managed cluster of Amazon EC2 instances

The EC2 Launch Type allows you to run containers on EC2 instances that you manage so you will be able to access the operating system instances.

CORRECT: "ECS with the EC2 launch type" is the correct answer.

INCORRECT: "EKS with Kubernetes managed infrastructure" is incorrect. The EKS service is a managed Kubernetes service that provides a fully-managed control plane so you would not have access to the EC2 instances that the platform runs on.

INCORRECT: "ECS with the Fargate launch type" is incorrect. The Fargate Launch Type is a serverless infrastructure managed by AWS so you do not have access to the operating system of the EC2 instances that the container platform runs on.

INCORRECT: "ECS with a default cluster" is incorrect. You need to choose the launch type to ensure you get the access required, not the cluster configuration.

43. Question

A new application runs on Amazon EC2 instances and uses API Gateway and AWS Lambda. The company is planning on running an advertising campaign that will likely result in significant hits to the application after each ad is run.

A Solutions Architect is concerned about the impact this may have on the application and would like to put in place some controls to limit the number of requests per second that hit the application.

What controls should the Solutions Architect implement?

1: Implement throttling rules on the API Gateway

2: Enable caching on the API Gateway and specify a size in gigabytes

3: Enable Lambda continuous scaling

4: API Gateway and Lambda scale automatically to handle any load so there’s no need to implement controls

Answer: 1

Explanation:

The key requirement is to limit the number of requests per second that hit the application. This can only be done by implementing throttling rules on the API Gateway. Throttling enables you to throttle the number of requests to your API which in turn means less traffic will be forwarded to your application server.

CORRECT: "Implement throttling rules on the API Gateway" is the correct answer.

INCORRECT: "Enable caching on the API Gateway and specify a size in gigabytes" is incorrect. Caching can improve performance but does not limit the amount of requests coming in.

INCORRECT: "Enable Lambda continuous scaling" is incorrect. Lambda continuous scaling does not resolve the scalability concerns with the EC2 application server.

INCORRECT: "API Gateway and Lambda scale automatically to handle any load so there's no need to implement controls" is incorrect. API Gateway and Lambda both scale up to their default limits however the bottleneck is with the application server running on EC2 which may not be able to scale to keep up with demand.

44. Question

A Solutions Architect has deployed a number of AWS resources using CloudFormation. Some changes must be made to a couple of resources within the stack. Due to recent failed updates, the Solutions Architect is a little concerned about the effects that implementing updates to the resources might have on other resources in the stack.

What is the easiest way to proceed cautiously?

1: Create and execute a change set

2: Use OpsWorks to manage the configuration changes

3: Use a direct update

4: Deploy a new stack to test the changes

Answer: 1

Explanation:

AWS CloudFormation provides two methods for updating stacks: direct update or creating and executing change sets. When you directly update a

stack, you submit changes and AWS CloudFormation immediately deploys them.

Use direct updates when you want to quickly deploy your updates. With change sets, you can preview the changes AWS CloudFormation will make to your stack, and then decide whether to apply those changes.

CORRECT: "Create and execute a change set" is the correct answer.

INCORRECT: "Use OpsWorks to manage the configuration changes" is incorrect. You cannot use OpsWorks to manage the configuration changes. OpsWorks is used for implementing managed Chef and Puppet services.

INCORRECT: "Use a direct update" is incorrect. Direct updates will not provide the safeguard of being able to preview the changes as changes sets do.

INCORRECT: "Deploy a new stack to test the changes" is incorrect. You do not need to go to the trouble and cost of deploying a new stack.

45. Question

A company has over 2000 users and is planning to migrate data into the AWS Cloud. Some of the data is user's home folders on an existing file share and the plan is to move this data to Amazon S3. Each user will have a folder in a shared bucket under the folder structure: *bucket* /home/%username%.

What steps should a Solutions Architect take to ensure that each user can access their own home folder and no one else's? (Select TWO)

1: Create a bucket policy that applies access permissions based on username

2: Create an IAM policy that applies folder-level permissions

3: Create an IAM policy that applies object-level S3 ACLs

4: Attach an S3 ACL sub-resource that grants access based on the %username% variable

5: Create an IAM group and attach the IAM policy, add IAM users to the group

Answer: 2,5

Explanation:

The AWS blog URL below explains how to construct an IAM policy for a similar scenario. Please refer to the article for detailed instructions.

CORRECT: "Create an IAM policy that applies folder-level permissions" is a correct answer.

CORRECT: "Create an IAM group and attach the IAM policy, add IAM users to the group" is also a correct answer.

INCORRECT: "Create a bucket policy that applies access permissions based on username" is incorrect. An IAM policy rather than a bucket policy should be used.

INCORRECT: "Create an IAM policy that applies object-level S3 ACLs" is incorrect as this cannot be done through an IAM policy.

INCORRECT: "Attach an S3 ACL sub-resource that grants access based on the %username% variable" is incorrect as an IAM policy should be used to control access.

46. Question

An event in CloudTrail is the record of an activity in an AWS account. What are the two types of events that can be logged in CloudTrail? (Select TWO)

1: Platform Events which are also known as hardware level operations

2: Data Events which are also known as data plane operations

3: System Events which are also known as instance level operations

4: Control Events which are also known as data plane operations

5: Management Events which are also known as control plane operations

Answer: 2,5

Explanation:

Trails can be configured to log Data events and management events:

Data events: These events provide insight into the resource operations performed on or within a resource. These are also known as data plane operations

Management events: Management events provide insight into management operations that are performed on resources in your AWS account. These are also known as control plane operations. Management events can also include non-API events that occur in your account

CORRECT: "Data Events which are also known as data plane operations" is a correct answer.

CORRECT: "Management Events which are also known as control plane operations" is also a correct answer.

INCORRECT: "Platform Events which are also known as hardware level operations" is incorrect as this not a valid event type.

INCORRECT: "System Events which are also known as instance level operations" is incorrect as this not a valid event type.

INCORRECT: "Control Events which are also known as data plane operations" is incorrect as this not a valid event type.

47. Question

A Solutions Architect is writing some code that uses an AWS Lambda function and would like to enable the function to connect to an Amazon ElastiCache cluster within an Amazon VPC in the same AWS account. What VPC-specific information must be included in the function to enable this configuration? (Select TWO)

1: VPC Subnet IDs

2: VPC Logical IDs

3: VPC Peering IDs

4: VPC Security Group IDs

5: VPC Route Table IDs

Answer: 1,4

Explanation:

To enable your Lambda function to access resources inside your private VPC, you must provide additional VPC-specific configuration information that includes VPC subnet IDs and security group IDs. AWS Lambda uses this information to set up elastic network interfaces (ENIs) that enable your function.

Please see the AWS article linked below for more details on the requirements

CORRECT: "VPC Subnet IDs" is the correct answer.

CORRECT: "VPC Security Group IDs" is the correct answer.

INCORRECT: "VPC Logical IDs" is incorrect as this is not required.

INCORRECT: "VPC Peering IDs" is incorrect as this is not required.

INCORRECT: "VPC Route Table IDs" is incorrect as this is not required.

48. Question

A Solutions Architect created a new subnet in an Amazon VPC and launched an Amazon EC2 instance into it. The Solutions Architect needs to directly access the EC2 instance from the Internet and cannot connect. Which steps should be undertaken to troubleshoot the issue? (Select TWO)

1: Check that the instance has a public IP address

2: Check that there is a NAT Gateway configured for the subnet

3: Check that Security Group has a rule for outbound traffic

4: Check that the route table associated with the subnet has an entry for an Internet Gateway

5: Check that you can ping the instance from another subnet

Answer: 1,4

Explanation:

A public subnet is a subnet that's associated with a route table that has a route to an Internet gateway.

Public subnets are subnets that have:

- "Auto-assign public IPv4 address" set to "Yes".
- The subnet route table has an attached Internet Gateway.

CORRECT: "Check that the instance has a public IP address" is the correct answer.

CORRECT: "Check that the route table associated with the subnet has an entry for an Internet Gateway" is the correct answer.

INCORRECT: "Check that there is a NAT Gateway configured for the subnet" is incorrect. A NAT Gateway is used for providing outbound Internet access for EC2 instances in private subnets.

INCORRECT: "Check that Security Group has a rule for outbound traffic" is incorrect. Security groups are stateful and do not need a rule for outbound traffic. For this solution you would only need to create an inbound rule that allows the relevant protocol.

INCORRECT: "Check that you can ping the instance from another subnet" is incorrect. Checking you can ping from another subnet does not relate to

being able to access the instance remotely as it uses different protocols and a different network path.

49. Question

A Solutions Architect just completed the implementation of a 2-tier web application for a client. The application uses Amazon EC2 instances, Amazon ELB and Auto Scaling across two subnets. After deployment the Solutions Architect noticed that only one subnet has EC2 instances running in it. What might be the cause of this situation?

1: The ELB is configured as an internal-only load balancer

2: The Auto Scaling Group has not been configured with multiple subnets

3: Cross-zone load balancing is not enabled on the ELB

4: The AMI is missing from the ASG's launch configuration

Answer: 2

Explanation:

You can specify which subnets Auto Scaling will launch new instances into. Auto Scaling will try to distribute EC2 instances evenly across AZs. If only one subnet has EC2 instances running in it the first thing to check is that you have added all relevant subnets to the configuration.

CORRECT: "The Auto Scaling Group has not been configured with multiple subnets" is the correct answer.

INCORRECT: "The ELB is configured as an internal-only load balancer" is incorrect. The type of ELB deployed is not relevant here as Auto Scaling is responsible for launching instances into subnets whereas ELB is responsible for distributing connections to the instances.

INCORRECT: "Cross-zone load balancing is not enabled on the ELB" is incorrect. Cross-zone load balancing is an ELB feature and ELB is not the issue here as it is not responsible for launching instances into subnets.

INCORRECT: "The AMI is missing from the ASG's launch configuration" is incorrect. If the AMI was missing from the launch configuration no instances would be running.

50. Question

A Solutions Architect is designing the messaging and streaming layers of a serverless application. The messaging layer will manage communications between components and the streaming layer will manage real-time analysis and processing of streaming data.

The Architect needs to select the most appropriate AWS services for these functions. Which services should be used for the messaging and streaming layers? (Select TWO)

1: Use Amazon Kinesis for collecting, processing and analyzing real-time streaming data

2: Use Amazon SWF for providing a fully managed messaging service

3: Use Amazon SNS for providing a fully managed messaging service

4: Use Amazon EMR for collecting, processing and analyzing real-time streaming data

5: Use AWS CloudTrail for collecting, processing and analyzing real-time streaming data

Answer: 1,3

Explanation:

Amazon Kinesis makes it easy to collect, process, and analyze real-time streaming data. With Amazon Kinesis Analytics, you can run standard SQL or build entire streaming applications using SQL

Amazon Simple Notification Service (Amazon SNS) provides a fully managed messaging service for pub/sub patterns using asynchronous event notifications and mobile push notifications for microservices, distributed systems, and serverless applications.

CORRECT: "Use Amazon Kinesis for collecting, processing and analyzing real-time streaming data" is the correct answer.

CORRECT: "Use Amazon SNS for providing a fully managed messaging service" is the correct answer.

INCORRECT: "Use Amazon SWF for providing a fully managed messaging service" is incorrect. Amazon Simple Workflow Service is used for executing tasks not sending messages.

INCORRECT: "Use Amazon EMR for collecting, processing and analyzing real-time streaming data" is incorrect. Amazon Elastic Map Reduce runs on EC2 instances so is not serverless.

INCORRECT: "Use AWS CloudTrail for collecting, processing and analyzing real-time streaming data" is incorrect. AWS CloudTrail is used for recording API activity on your account.

51. Question

An existing Auto Scaling group is running with eight Amazon EC2 instances. A Solutions Architect has attached an Elastic Load Balancer (ELB) to the Auto Scaling group by connecting a Target Group. The ELB is in the same region and already has ten EC2 instances running in the Target Group.

When attempting to attach the ELB the request immediately fails, what is the MOST likely cause?

1: Adding the 10 EC2 instances to the ASG would exceed the maximum capacity configured

2: One or more of the instances are unhealthy

3: ASGs cannot be edited once defined, you would need to recreate it

4: You cannot attach running EC2 instances to an ASG

Answer: 1

Explanation:

You can attach one or more Target Groups to your ASG to include instances behind an ALB and the ELBs must be in the same region. Once you do this any EC2 instance existing or added by the ASG will be automatically registered with the ASG defined ELBs. If adding an instance to an ASG would result in exceeding the maximum capacity of the ASG the request will fail.

CORRECT: "Adding the 10 EC2 instances to the ASG would exceed the maximum capacity configured" is the correct answer.

INCORRECT: "One or more of the instances are unhealthy" is incorrect. After the load balancer enters the InService state, Amazon EC2 Auto Scaling terminates and replaces any instances that are reported as unhealthy. However, in this case the request immediately failed so having one or more unhealthy instances is not the issue.

INCORRECT: "ASGs cannot be edited once defined, you would need to recreate it" is incorrect. Auto Scaling Groups can be edited once created

(however launch configurations cannot be edited).

INCORRECT: "You cannot attach running EC2 instances to an ASG" is incorrect. You can attach running EC2 instances to an ASG.

52. Question

The AWS Acceptable Use Policy describes permitted and prohibited behavior on AWS and includes descriptions of prohibited security violations and network abuse. According to the policy, what is AWS's position on penetration testing?

1: AWS do not allow any form of penetration testing

2: AWS allow penetration testing by customers on their own VPC resources

3: AWS allow penetration for some resources without prior authorization

4: AWS allow penetration testing for all resources

Answer: 3

Explanation:

AWS customers are welcome to carry out security assessments or penetration tests against their AWS infrastructure without prior approval for 8 services. Please check the AWS link below for the latest information.

CORRECT: "AWS allow penetration for some resources without prior authorization" is the correct answer.

INCORRECT: "AWS do not allow any form of penetration testing" is incorrect as explained above.

INCORRECT: "AWS allow penetration testing by customers on their own VPC resources" is incorrect as explained above.

INCORRECT: "AWS allow penetration testing for all resources" is incorrect as explained above.

53. Question

An application regularly uploads files from an Amazon EC2 instance to an Amazon S3 bucket. The files can be a couple of gigabytes in size and sometimes the uploads are slower than desired. What method can be used to increase throughput and reduce upload times?

1: Turn off versioning on the destination bucket

2: Randomize the object names when uploading

3: Use Amazon S3 multipart upload
4: Upload the files using the S3 Copy SDK or REST API

Answer: 3
Explanation:
Multipart upload can be used to speed up uploads to S3. Multipart upload uploads objects in parts independently, in parallel and in any order. It is performed using the S3 Multipart upload API and is recommended for objects of 100MB or larger. It can be used for objects from 5MB up to 5TB and must be used for objects larger than 5GB.
CORRECT: "Use Amazon S3 multipart upload" is the correct answer.
INCORRECT: "Turn off versioning on the destination bucket" is incorrect. Turning off versioning will not speed up the upload.
INCORRECT: "Randomize the object names when uploading" is incorrect. Randomizing object names provides no value in this context, random prefixes are used for intensive read requests.
INCORRECT: "Upload the files using the S3 Copy SDK or REST API" is incorrect. Copy is used for copying, moving and renaming objects within S3 not for uploading to S3.

54. Question
A three-tier web application that is deployed in an Amazon VPC has been experiencing heavy load on the database layer. The database layer uses an Amazon RDS MySQL instance in a multi-AZ configuration. Customers have been complaining about poor response times. During troubleshooting it has been noted that the database layer is experiencing high read contention during peak hours of the day.
What are two possible options that could be used to offload some of the read traffic from the database to resolve the performance issues? (Select TWO)
1: Add RDS read replicas in each AZ
2: Use an ELB to distribute load between RDS instances
3: Migrate to DynamoDB
4: Use a larger RDS instance size
5: Deploy ElastiCache in each AZ

Answer: 1,5

Explanation:

Amazon ElastiCache is a web service that makes it easy to deploy and run Memcached or Redis protocol-compliant server nodes in the cloud. The in-memory caching provided by ElastiCache can be used to significantly improve latency and throughput for many read-heavy application workloads or compute-intensive workloads.

Read replicas are used for read heavy DBs and replication is asynchronous. They are for workload sharing and offloading and are created from a snapshot of the master instance

CORRECT: "Add RDS read replicas in each AZ" is a correct answer.

CORRECT: "Deploy ElastiCache in each AZ" is also a correct answer.

INCORRECT: "Use an ELB to distribute load between RDS instances" is incorrect. You cannot use an ELB to distributed load between different RDS instances.

INCORRECT: "Migrate to DynamoDB" is incorrect. Moving from a relational DB to a NoSQL DB (DynamoDB) is unlikely to be a viable solution.

INCORRECT: "Use a larger RDS instance size" is incorrect. Using a larger instance size may alleviate the problems the question states that the solution should offload reads from the main DB, read replicas can do this.

55. Question

A Solutions Architect is creating a multi-tier application that includes loosely-coupled, distributed application components and needs to determine a method of sending notifications instantaneously. Using Amazon SNS which transport protocols are supported? (Select TWO)

1: Amazon SWF

2: FTP

3: HTTPS

4: AWS Lambda

5: Email-JSON

Answer: 3,5

Explanation:

Note that the questions asks you which transport protocols are supported, NOT which subscribers – therefore AWS Lambda is not supported.

Amazon SNS supports notifications over multiple transport protocols:

- HTTP/HTTPS – subscribers specify a URL as part of the subscription registration.
- Email/Email-JSON – messages are sent to registered addresses as email (text-based or JSON-object).
- SQS – users can specify an SQS standard queue as the endpoint.
- SMS – messages are sent to registered phone numbers as SMS text messages.

CORRECT: "HTTPS" is the correct answer.

CORRECT: "Email-JSON" is the correct answer.

INCORRECT: "Amazon SWF" is incorrect as this is not a supported transport protocol.

INCORRECT: "FTP" is incorrect as this is not a supported transport protocol.

INCORRECT: "AWS Lambda" is incorrect as this is not a supported transport protocol.

56. Question

A manager is concerned that the default service limits my soon be reached for several AWS services. Which AWS tool can a Solutions Architect use to display current usage and limits?

1: AWS Systems Manager

2: AWS Trusted Advisor

3: AWS Dashboard

4: Amazon CloudWatch

Answer: 2

Explanation:

Trusted Advisor is an online resource to help you reduce cost, increase performance, and improve security by optimizing your AWS environment. Trusted Advisor provides real time guidance to help you provision your resources following AWS best practices.

AWS Trusted Advisor offers a Service Limits check (in the Performance category) that displays your usage and limits for some aspects of some services.

CORRECT: "AWS Trusted Advisor" is the correct answer.

INCORRECT: "AWS Systems Manager" is incorrect. AWS Systems Manager gives you visibility and control of your infrastructure on AWS. Systems Manager provides a unified user interface so you can view operational data from multiple AWS services and allows you to automate operational tasks across your AWS resources.

INCORRECT: "AWS Dashboard" is incorrect. There is no service known as “AWS Dashboard”.

INCORRECT: "Amazon CloudWatch" is incorrect. Amazon CloudWatch is used for performance monitoring not displaying usage limits..

57. Question

A company has multiple AWS accounts for several environments (Prod, Dev, Test etc.). A Solutions Architect would like to copy an Amazon EBS snapshot from DEV to PROD. The snapshot is from an EBS volume that was encrypted with a custom key.

What steps must be performed to share the encrypted EBS snapshot with the Prod account? (Select TWO)

1: Share the custom key used to encrypt the volume

2: Make a copy of the EBS volume and unencrypt the data in the process

3: Create a snapshot of the unencrypted volume and share it with the Prod account

4: Modify the permissions on the encrypted snapshot to share it with the Prod account

5: Use CloudHSM to distribute the encryption keys use to encrypt the volume

Answer: 1,4

Explanation:

When an EBS volume is encrypted with a custom key you must share the custom key with the PROD account. You also need to modify the permissions on the snapshot to share it with the PROD account. The PROD

account must copy the snapshot before they can then create volumes from the snapshot

Note that you cannot share encrypted volumes created using a default CMK key and you cannot change the CMK key that is used to encrypt a volume.

CORRECT: "Share the custom key used to encrypt the volume" is a correct answer.

CORRECT: "Modify the permissions on the encrypted snapshot to share it with the Prod account" is also a correct answer.

INCORRECT: "Make a copy of the EBS volume and unencrypt the data in the process" is incorrect. You do not need to decrypt the data as there is a workable solution that keeps the data secure at all times.

INCORRECT: "Create a snapshot of the unencrypted volume and share it with the Prod account" is incorrect as the volume is already encrypted as security should be maintained.

INCORRECT: "Use CloudHSM to distribute the encryption keys use to encrypt the volume" is incorrect. CloudHSM is used for key management and storage but not distribution..

58. Question

An application you manage runs a number of components using a micro-services architecture. Several ECS container instances in your ECS cluster are displaying as disconnected. The ECS instances were created from the Amazon ECS-Optimized AMI. What steps might you take to troubleshoot the issue? (Select TWO)

1: Verify that the instances have the correct IAM group applied

2: Verify that the container instances have the container agent installed

3: Verify that the IAM instance profile has the necessary permissions

4: Verify that the container agent is running on the container instances

5: Verify that the container instances are using the Fargate launch type

Answer: 3,4

Explanation:

The ECS container agent is included in the Amazon ECS optimized AMI and can also be installed on any EC2 instance that supports the ECS

specification (only supported on EC2 instances). Therefore, you don't need to verify that the agent is installed.

You need to verify that the installed agent is running and that the IAM instance profile has the necessary permissions applied.

Troubleshooting steps for containers include:

- Verify that the Docker daemon is running on the container instance.
- Verify that the Docker Container daemon is running on the container instance.
- Verify that the container agent is running on the container instance.
- Verify that the IAM instance profile has the necessary permissions.

CORRECT: "Verify that the IAM instance profile has the necessary permissions" is the correct answer.

CORRECT: "Verify that the container agent is running on the container instances" is the correct answer.

INCORRECT: "Verify that the instances have the correct IAM group applied" is incorrect. You apply IAM roles (instance profile) to EC2 instances, not groups..

INCORRECT: "Verify that the container instances have the container agent installed" is incorrect as the ECS-optimized AMI has the agent included.

INCORRECT: "Verify that the container instances are using the Fargate launch type" is incorrect. This example is based on the EC2 launch type not the Fargate launch type. With Fargate the infrastructure is managed for you by AWS.

59. Question

The application development team in a company have created a new application written in .NET. A Solutions Architect is looking for a way to easily deploy the application whilst maintaining full control of the underlying resources.

Which PaaS service provided by AWS would BEST suit this requirement?

1: CloudFront

2: Elastic Beanstalk

3: EC2 Placement Groups

4: CloudFormation

Answer: 2

Explanation:

AWS Elastic Beanstalk can be used to quickly deploy and manage applications in the AWS Cloud. Developers upload applications and Elastic Beanstalk handles the deployment details of capacity provisioning, load balancing, auto-scaling, and application health monitoring. It is considered to be a Platform as a Service (PaaS) solution and allows full control of the underlying resources.

CORRECT: "Elastic Beanstalk" is the correct answer.

INCORRECT: "CloudFront" is incorrect. CloudFront is a content delivery network for caching content to improve performance.

INCORRECT: "EC2 Placement Groups" is incorrect. EC2 Placement Groups are used to control how instances are launched to enable low-latency connectivity or to be spread across distinct hardware.

INCORRECT: "CloudFormation" is incorrect. CloudFormation uses templates to provision infrastructure.

60. Question

A Solutions Architect is building a small web application running on Amazon EC2 that will be serving static content. The user base is spread out globally and speed is important. Which AWS service can deliver the best user experience cost-effectively and reduce the load on the web server?

1: Amazon RedShift

2: Amazon S3

3: Amazon CloudFront

4: Amazon EBS volume

Answer: 3

Explanation:

This is a good use case for Amazon CloudFront as the user base is spread out globally and CloudFront can cache the content closer to users and also reduce the load on the web server running on EC2.

CORRECT: "Amazon CloudFront" is the correct answer.
INCORRECT: "Amazon RedShift" is incorrect. Amazon RedShift is a data warehouse and is not suitable in this solution.
INCORRECT: "Amazon S3" is incorrect. Amazon S3 is very cost-effective however a bucket is located in a single region and therefore performance is not so great for users a long distance from the bucket.
INCORRECT: "Amazon EBS volume" is incorrect. EBS is not the most cost-effective storage solution and the data would be located in a single region to latency could be an issue.

61. Question

Amazon CloudWatch is being used to monitor the performance of AWS Lambda. Which metrics does Lambda track? (Select TWO)

1: Total number of requests
2: Latency per request
3: Number of users
4: Total number of connections
5: Total number of transactions

Answer: 1,2

Explanation:
AWS Lambda automatically monitors Lambda functions and reports metrics through Amazon CloudWatch. Lambda tracks the number of requests, the latency per request, and the number of requests resulting in an error. You can view the request rates and error rates using the AWS Lambda Console, the CloudWatch console, and other AWS resources.
CORRECT: "Total number of requests" is a correct answer.
CORRECT: "Latency per request" is also a correct answer.
INCORRECT: "Number of users" is incorrect as this is not returned.
INCORRECT: "Total number of connections" is incorrect as this is not returned.
INCORRECT: "Total number of transactions" is incorrect as this is not returned.

62. Question

An Amazon EC2 instance running a video on demand web application has been experiencing high CPU utilization. A Solutions Architect needs to take steps to reduce the impact on the EC2 instance and improve performance for consumers. Which of the steps below would help?

1: Use ElastiCache as the web front-end and forward connections to EC2 for cache misses

2: Create a CloudFront distribution and configure a custom origin pointing at the EC2 instance

3: Create an ELB and place it in front of the EC2 instance

4: Create a CloudFront RTMP distribution and point it at the EC2 instance

Answer: 2

Explanation:

This is a good use case for CloudFront which is a content delivery network (CDN) that caches content to improve performance for users who are consuming the content. This will take the load off of the EC2 instances as CloudFront has a cached copy of the video files.

An origin is the origin of the files that the CDN will distribute. Origins can be either an S3 bucket, an EC2 instance, and Elastic Load Balancer, or Route 53 – can also be external (non-AWS).

CORRECT: "Create a CloudFront distribution and configure a custom origin pointing at the EC2 instance" is the correct answer.

INCORRECT: "Use ElastiCache as the web front-end and forward connections to EC2 for cache misses" is incorrect. ElastiCache cannot be used as an Internet facing web front-end.

INCORRECT: "Create an ELB and place it in front of the EC2 instance" is incorrect. Placing an ELB in front of a single EC2 instance does not help to reduce load.

INCORRECT: "Create a CloudFront RTMP distribution and point it at the EC2 instance" is incorrect. For RTMP CloudFront distributions files must be stored in an S3 bucket.

63. Question

A Solutions Architect needs to create a file system that can be concurrently accessed by multiple Amazon EC2 instances across multiple availability zones. The file system needs to support high throughput and the ability to burst. As the data that will be stored on the file system will be sensitive, it must be encrypted at rest and in transit.

Which storage solution should the Solutions Architect use for the shared file system?

1: Add EBS volumes to each EC2 instance and configure data replication

2: Use the Elastic Block Store (EBS) and mount the file system at the block level

3: Use the Elastic File System (EFS) and mount the file system using NFS

4: Add EBS volumes to each EC2 instance and use an ELB to distribute data evenly between the volumes

Answer: 3

Explanation:

EFS is a fully-managed service that makes it easy to set up and scale file storage in the Amazon Cloud. EFS file systems are mounted using the NFSv4.1 protocol. EFS is designed to burst to allow high throughput levels for periods of time. EFS also offers the ability to encrypt data at rest and in transit.

CORRECT: "Use the Elastic File System (EFS) and mount the file system using NFS" is the correct answer.

INCORRECT: "Add EBS volumes to each EC2 instance and configure data replication" is incorrect. Adding EBS volumes to each instance and configuring data replication is not the best solution for this scenario and there is no native capability within AWS for performing the replication. Some 3rd party data management software does use this model, however.

INCORRECT: "Use the Elastic Block Store (EBS) and mount the file system at the block level" is incorrect. EBS is a block-level storage system not a file-level storage system. You cannot mount EBS volumes from multiple instances across AZs.

INCORRECT: "Add EBS volumes to each EC2 instance and use an ELB to distribute data evenly between the volumes" is incorrect. You cannot use an ELB to distribute data between EBS volumes.

64. Question

A new department will begin using AWS services an AWS account and a Solutions Architect needs to create an authentication and authorization strategy. Select the correct statements regarding IAM groups? (Select TWO)

1: IAM groups can be used to assign permissions to users

2: IAM groups can be nested up to 4 levels

3: IAM groups can be used to group EC2 instances

4: IAM groups can temporarily assume a role to take on permissions for a specific task

5: An IAM group is not an identity and cannot be identified as a principal in an IAM policy

Answer: 1,5

Explanation:

An IAM group is a collection of IAM users. Groups let you specify permissions for multiple users, which can make it easier to manage the permissions for those users.

The following facts apply to IAM Groups:

- Groups are collections of users and have policies attached to them.
- A group is not an identity and cannot be identified as a principal in an IAM policy.
- Use groups to assign permissions to users.
- IAM groups cannot be used to group EC2 instances.
- Only users and services can assume a role to take on permissions (not groups).

CORRECT: "IAM groups can be used to assign permissions to users" is a correct answer.

CORRECT: "An IAM group is not an identity and cannot be identified as a principal in an IAM policy" is also a correct answer.

INCORRECT: "IAM groups can be nested up to 4 levels" is incorrect as this not possible.

INCORRECT: "IAM groups can be used to group EC2 instances" is incorrect as they can only be used to group user accounts.

INCORRECT: "IAM groups can temporarily assume a role to take on permissions for a specific task" is incorrect as this is not possible.

65. Question

The development team in a media organization is moving their SDLC processes into the AWS Cloud. Which AWS service can a Solutions Architect recommend that is primarily used for software version control?

1: CloudHSM
2: CodeStar
3: CodeCommit
4: Step Functions

Answer: 3

Explanation:

AWS CodeCommit is a fully-managed source control service that hosts secure Git-based repositories. It makes it easy for teams to collaborate on code in a secure and highly scalable ecosystem. CodeCommit eliminates the need to operate your own source control system or worry about scaling its infrastructure. You can use CodeCommit to securely store anything from source code to binaries, and it works seamlessly with your existing Git tools.

CORRECT: "CodeCommit" is the correct answer.

INCORRECT: "CloudHSM" is incorrect. AWS CloudHSM is a cloud-based hardware security module (HSM) that enables you to easily generate and use your own encryption keys on the AWS Cloud

INCORRECT: "CodeStar" is incorrect. AWS CodeStar enables you to quickly develop, build, and deploy applications on AWS..

INCORRECT: "Step Functions" is incorrect. AWS Step Functions lets you coordinate multiple AWS services into serverless workflows so you can build and update apps quickly.

SET 6: PRACTICE QUESTIONS ONLY

For training purposes , go directly to Set 6: Practice Questions, Answers & Explanations

1. Question

A company runs a streaming media service and the content is stored on Amazon S3. The media catalog server pulls updated content from S3 and can issue over 1 million read operations per second for short periods. Latency must be kept under 5ms for these updates. Which solution will provide the BEST performance for the media catalog updates?

1: Update the application code to use an Amazon ElastiCache for Redis cluster

2: Implement Amazon CloudFront and cache the content at Edge Locations

3: Update the application code to use an Amazon DynamoDB Accelerator cluster

4: Implement an Instance store volume on the media catalog server

2. Question

Three AWS accounts are owned by the same company but in different regions. Account Z has two AWS Direct Connect connections to two separate company offices. Accounts A and B require the ability to route across account Z's Direct Connect connections to each company office. A Solutions Architect has created an AWS Direct Connect gateway in account Z.

How can the required connectivity be configured?

1: Associate the Direct Connect gateway to a transit gateway in each region

2: Associate the Direct Connect gateway to a virtual private gateway in account A and B

3: Create a VPC Endpoint to the Direct Connect gateway in account A and B

4: Create a PrivateLink connection in Account Z and ENIs in accounts A and B

3. Question

A tool needs to analyze data stored in an Amazon S3 bucket. Processing the data takes a few seconds and results are then written to another S3 bucket. Less than 256 MB of memory is needed to run the process. What would be the MOST cost-effective compute solutions for this use case?

1: AWS Fargate tasks

2: AWS Lambda functions

3: Amazon EC2 spot instances

4: Amazon Elastic Beanstalk

4. Question

An application makes calls to a REST API running on Amazon EC2 instances behind an Application Load Balancer (ALB). Most API calls complete quickly. However, a single endpoint is making API calls that require much longer to complete and this is introducing overall latency into the system. What steps can a Solutions Architect take to minimize the effects of the long-running API calls?

1: Change the EC2 instance to one with enhanced networking to reduce latency

2: Create an Amazon SQS queue and decouple the long-running API calls

3: Increase the ALB idle timeout to allow the long-running requests to complete

4: Change the ALB to a Network Load Balancer (NLB) and use SSL/TLS termination

5. Question

An application runs on EC2 instances in a private subnet behind an Application Load Balancer in a public subnet. The application is highly available and distributed across multiple AZs. The EC2 instances must make API calls to an internet-based service. How can the Solutions Architect enable highly available internet connectivity?

1: Create a NAT gateway and attach it to the VPC. Add a route to the gateway to each private subnet route table

2: Configure an internet gateway. Add a route to the gateway to each private subnet route table

3: Create a NAT instance in the private subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT instance

4: Create a NAT gateway in the public subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT gateway

6. Question

A legacy application is being migrated into AWS. The application has a large amount of data that is rarely accessed. When files are accessed, they are retrieved sequentially. The application will be migrated onto an Amazon EC2 instance.

What is the LEAST expensive EBS volume type for this use case?

1: Cold HDD (sc1)

2: Provisioned IOPS SSD (io1)

3: General Purpose SSD (gp2)

4: Throughput Optimized HDD (st1)

7. Question

An application uses an Amazon RDS database and Amazon EC2 instances in a web tier. The web tier instances must not be directly accessible from the internet to improve security.

How can a Solutions Architect meet these requirements?

1: Launch the EC2 instances in a private subnet and create an Application Load Balancer in a public subnet

2: Launch the EC2 instances in a private subnet with a NAT gateway and update the route table

3: Launch the EC2 instances in a public subnet and use AWS WAF to protect the instances from internet-based attacks

4: Launch the EC2 instances in a public subnet and create an Application Load Balancer in a public subnet

8. Question

A company runs an application on premises that stores a large quantity of semi-structured data using key-value pairs. The application code will be migrated to AWS Lambda and a highly scalable solution is required for storing the data.

Which datastore will be the best fit for these requirements?

1: Amazon EFS

2: Amazon RDS MySQL

3: Amazon EBS

4: Amazon DynamoDB

9. Question

An application uses a MySQL database running on an Amazon EC2 instance. The application generates high I/O and constant writes to a single table on the database. Which Amazon EBS volume type will provide the MOST consistent performance and low latency?

1: General Purpose SSD (gp2)

2: Provisioned IOPS SSD (io1)

3: Throughput Optimized HDD (st1)

4: Cold HDD (sc1)

10. Question

A Solutions Architect needs to capture information about the traffic that reaches an Amazon Elastic Load Balancer. The information should include the source, destination, and protocol.

What is the most secure and reliable method for gathering this data?

1: Create a VPC flow log for each network interface associated with the ELB

2: Enable Amazon CloudTrail logging and configure packet capturing

3: Use Amazon CloudWatch Logs to review detailed logging information

4: Create a VPC flow log for the subnets in which the ELB is running

11. Question

The Solutions Architect in charge of a critical application must ensure the Amazon EC2 instances are able to be launched in another AWS Region in the event of a disaster.

What steps should the Solutions Architect take? (Select TWO)

1: Launch instances in the second Region using the S3 API

2: Create AMIs of the instances and copy them to another Region

3: Enable cross-region snapshots for the Amazon EC2 instances

4: Launch instances in the second Region from the AMIs

5: Copy the snapshots using Amazon S3 cross-region replication

12. Question

A company needs to ensure that they can failover between AWS Regions in the event of a disaster seamlessly with minimal downtime and data loss. The applications will run in an active-active configuration.

Which DR strategy should a Solutions Architect recommend?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

13. Question

A company has launched a multi-tier application architecture. The web tier and database tier run on Amazon EC2 instances in private subnets within the same Availability Zone.

Which combination of steps should a Solutions Architect take to add high availability to this architecture? (Select TWO)

1: Create new public subnets in the same AZ for high availability and move the web tier to the public subnets

2: Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs

3: Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)

4: Create new private subnets in the same VPC but in a different AZ. Create a database using Amazon EC2 in one AZ

5: Create new private subnets in the same VPC but in a different AZ. Migrate the database to an Amazon RDS multi-AZ deployment

14. Question

An on-premises server runs a MySQL database and will be migrated to the AWS Cloud. The company require a managed solution that supports high availability and automatic failover in the event of the outage of an Availability Zone (AZ).

Which solution is the BEST fit for these requirements?

1: Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon RDS MySQL Multi-AZ deployment

2: Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon EC2 MySQL Multi-AZ deployment

3: Create a snapshot of the MySQL database server and use AWS DataSync to migrate the data Amazon S3. Launch a new Amazon RDS MySQL Multi-AZ deployment from the snapshot

4: Use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon RDS MySQL. Use the Schema Conversion Tool (SCT) to enable conversion from MySQL to Amazon RDS

15. Question

The database layer of an on-premises web application is being migrated to AWS. The database currently uses an in-memory cache. A Solutions Architect must deliver a solution that supports high availability and replication for the caching layer.

Which service should the Solutions Architect recommend?

1: Amazon ElastiCache Redis

2: Amazon RDS Multi-AZ

3: Amazon ElastiCache Memcached

4: Amazon DynamoDB

16. Question

A Solutions Architect has created an AWS Organization with several AWS accounts. Security policy requires that use of specific API actions

are limited across all accounts. The Solutions Architect requires a method of centrally controlling these actions.

What is the SIMPLEST method of achieving the requirements?

1: Create a Network ACL that limits access to the services or actions and attach it to all relevant subnets

2: Create an IAM policy in the root account and attach it to users and groups in each account

3: Create cross-account roles in each account to limit access to the services and actions that are allowed

4: Create a service control policy in the root organizational unit to deny access to the services or actions

17. Question

A company has a fleet of Amazon EC2 instances behind an Elastic Load Balancer (ELB) that are a mixture of c4.2xlarge instance types and c5.large instances. The load on the CPUs on the c5.large instances has been very high, often hitting 100% utilization, whereas the c4.2xlarge instances have been performing well.

What should a Solutions Architect recommend to resolve the performance issues?

1: Enable the weighted routing policy on the ELB and configure a higher weighting for the c4.2xlarge instances

2: Add all of the instances into a Placement Group

3: Change the configuration to use only c4.2xlarge instance types

4: Add more c5.large instances to spread the load more evenly

18. Question

A Solutions Architect created a new IAM user account for a temporary employee who recently joined the company. The user does not have permissions to perform any actions, which statement is true about newly created users in IAM?

1: They are created with no permissions

2: They are created with limited permissions

3: They are created with full permissions

4: They are created with user privileges

19. Question

A government agency is using CloudFront for a web application that receives personally identifiable information (PII) from citizens. What feature of CloudFront applies an extra level of encryption at CloudFront edge locations to ensure the PII data is secured end-to-end?

1: Object invalidation

2: Field-level encryption

3: RTMP distribution

4: Origin access identity

20. Question

A company has multiple Amazon VPCs that are peered with each other. The company would like to use a single Elastic Load Balancer (ELB) to route traffic to multiple EC2 instances in peered VPCs within the same region. How can this be achieved?

1: This is not possible, the instances that an ELB routes traffic to must be in the same VPC

2: This is possible using the Classic Load Balancer (CLB) if using Instance IDs

3: This is possible using the Network Load Balancer (NLB) and Application Load Balancer (ALB) if using IP addresses as targets

4: This is not possible with ELB, you would need to use Route 53

21. Question

Some data has become corrupted in an Amazon RDS database. A Solutions Architect plans to use point-in-time restore to recover the data to the last known good configuration. Which of the following statements is correct about restoring an RDS database to a specific point-in-time? (Select TWO)

1: You can restore up to the last 5 minutes

2: Custom DB security groups are applied to the new DB instance

3: You can restore up to the last 1 minute

4: The default DB security group is applied to the new DB instance

5: The database restore overwrites the existing database

22. Question

An application is generating a large amount of clickstream events data that is being stored on S3. The business needs to understand customer behavior and want to run complex analytics queries against the data.

Which AWS service can be used for this requirement?

1: Amazon RedShift

2: Amazon Neptune

3: Amazon RDS

4: Amazon Kinesis Firehose

23. Question

A Solutions Architect is deploying a production application that will use several Amazon EC2 instances and run constantly on an ongoing basis. The application cannot be interrupted or restarted. Which EC2 pricing model would be best for this workload?

1: Reserved instances

2: On-demand instances

3: Spot instances

4: Flexible instances

24. Question

A customer has requested some advice on how to implement security measures in their Amazon VPC. The client has recently been the victim of some hacking attempts. The client wants to implement measures to mitigate further threats. The client has explained that the attacks always come from the same small block of IP addresses.

What would be a quick and easy measure to help prevent further attacks?

1: Use a Security Group rule that denies connections from the block of IP addresses

2: Use CloudFront's DDoS prevention features

3: Create a Bastion Host restrict all connections to the Bastion Host only

4: Use a Network ACL rule that denies connections from the block of IP addresses

25. Question

An Amazon EC2 instance has been launched into an Amazon VPC. A Solutions Architect needs to ensure that instances have both a private and public DNS hostnames. Assuming settings were not changed during creation of the VPC, how will DNS hostnames be assigned by default? (Select TWO)

1: In all VPCs instances no DNS hostnames will be assigned

2: In a non-default VPC instances will be assigned a public and private DNS hostname

3: In a default VPC instances will be assigned a public and private DNS hostname

4: In a non-default VPC instances will be assigned a private but not a public DNS hostname

5: In a default VPC instances will be assigned a private but not a public DNS hostname

26. Question

A fleet of Amazon EC2 instances running Linux will be launched in an Amazon VPC. An application development framework and some custom software must be installed on the instances. The installation will be initiated using some scripts. What feature enables a Solutions Architect to specify the scripts the software can be installed during the EC2 instance launch?

1: Metadata

2: Run Command

3: AWS Config

4: User Data

27. Question

A company is investigating ways to analyze and process large amounts of data in the cloud faster, without needing to load or transform the data in a data warehouse. The data resides in Amazon S3.

Which AWS services would allow the company to query the data in place? (Select TWO)

1: Amazon S3 Select

2: Amazon Kinesis Data Streams

3: Amazon Elasticsearch

4: Amazon RedShift Spectrum

5: Amazon SWF

28. Question

A distribution method is required for some static files. The requests will mainly be GET requests and a high volume of GETs is expected, often exceeding 2000 per second. The files are currently stored in an S3 bucket. According to AWS best practices, how can performance be optimized?

1: Use cross-region replication to spread the load across regions

2: Use ElastiCache to cache the content

3: Integrate CloudFront with S3 to cache the content

4: Use S3 Transfer Acceleration

29. Question

An Auto Scaling group of Amazon EC2 instances behind an Elastic Load Balancer (ELB) is running in an Amazon VPC. Health checks are configured on the ASG to use EC2 status checks. The ELB has determined that an EC2 instance is unhealthy and has removed it from service. A Solutions Architect noticed that the instance is still running and has not been terminated by EC2 Auto Scaling.

What would be an explanation for this behavior?

1: The ASG is waiting for the cooldown timer to expire before terminating the instance

2: Connection draining is enabled and the ASG is waiting for in-flight requests to complete

3: The ELB health check type has not been selected for the ASG and so it is unaware that the instance has been determined to be unhealthy by the ELB and has been removed from service

4: The health check grace period has not yet expired

30. Question

A financial services company regularly runs an analysis of the day's transaction costs, execution reporting, and market performance. The company currently uses third-party commercial software for provisioning, managing, monitoring, and scaling the computing jobs which utilize a large fleet of EC2 instances.

The company is seeking to reduce costs and utilize AWS services. Which AWS service could be used in place of the third-party software?

1: Amazon Athena
2: AWS Systems Manager
3: Amazon Lex
4: AWS Batch

31. Question

A customer is deploying services in a hybrid cloud model. The customer has mandated that data is transferred directly between cloud data centers, bypassing ISPs.

Which AWS service can be used to enable hybrid cloud connectivity?

1: AWS Direct Connect
2: Amazon VPC
3: IPSec VPN
4: Amazon Route 53

32. Question

An Amazon Elastic File System (EFS) has been created to store data that will be accessed by a large number of Amazon EC2 instances. The data is sensitive and a Solutions Architect is creating a design for security measures to protect the data. It is required that network traffic is restricted correctly based on firewall rules and access from hosts is restricted by user or group.

How can this be achieved with Amazon EFS? (Select TWO)

1: Use POSIX permissions to control access from hosts by user or group
2: Use AWS Web Application Firewall (WAF) to protect EFS
3: Use EFS Security Groups to control network traffic

4: Use Network ACLs to control the traffic
5: Use IAM groups to control access by user or group

33. Question

A large multi-national client has requested a design for a multi-region database. The master database will be in the EU (Frankfurt) region and databases will be located in 4 other regions to service local read traffic. The database should be a managed service including the replication.

The solution should be cost-effective and secure. Which AWS service can deliver these requirements?

1: RDS with Multi-AZ
2: EC2 instances with EBS replication
3: RDS with cross-region Read Replicas
4: ElastiCache with Redis and clustering mode enabled

34. Question

A Solutions Architect is designing the system monitoring and deployment layers of a serverless application. The system monitoring layer will manage system visibility through recording logs and metrics and the deployment layer will deploy the application stack and manage workload changes through a release management process.

The Architect needs to select the most appropriate AWS services for these functions. Which services and frameworks should be used for the system monitoring and deployment layers? (Select TWO)

1: Use AWS CloudTrail for consolidating system and application logs and monitoring custom metrics
2: Use AWS X-Ray to package, test, and deploy the serverless application stack
3: Use AWS SAM to package, test, and deploy the serverless application stack
4: Use Amazon CloudWatch for consolidating system and application logs and monitoring custom metrics
5: Use AWS Lambda to package, test, and deploy the serverless application stack

35. Question

One of the departments in a company has been generating a large amount of data on Amazon S3 and costs are increasing. Data older than 90 days is rarely accessed but must be retained for several years. If this data does need to be accessed at least 24 hours notice is provided. How can a Solutions Architect optimize the costs associated with storage of this data whilst ensuring it is accessible if required?

1: Implement archival software that automatically moves the data to tape

2: Use S3 lifecycle policies to move data to the STANDARD_IA storage class

3: Use S3 lifecycle policies to move data to GLACIER after 90 days

4: Select the older data and manually migrate it to GLACIER

36. Question

A Solutions Architect enabled Access Logs on an Application Load Balancer (ALB) and needs to process the log files using a hosted Hadoop service. What configuration changes and services can be leveraged to deliver this requirement?

1: Configure Access Logs to be delivered to EC2 and install Hadoop for processing the log files

2: Configure Access Logs to be delivered to DynamoDB and use EMR for processing the log files

3: Configure Access Logs to be delivered to S3 and use Kinesis for processing the log files

4: Configure Access Logs to be delivered to S3 and use EMR for processing the log files

37. Question

A web application receives order processing information from customers and places the messages on an Amazon SQS queue. A fleet of Amazon EC2 instances are configured to pick up the messages, process them, and store the results in a DynamoDB table. The current configuration has been resulting in a large number of empty responses to ReceiveMessage API requests.

A Solutions Architect needs to eliminate empty responses to reduce operational overhead. How can this be done?

1: Use a Standard queue to provide at-least-once delivery, which means that each message is delivered at least once

2: Use a FIFO (first-in-first-out) queue to preserve the exact order in which messages are sent and received

3: Configure Long Polling to eliminate empty responses by allowing Amazon SQS to wait until a message is available in a queue before sending a response

4: Configure Short Polling to eliminate empty responses by reducing the length of time a connection request remains open

38. Question

A Solutions Architect has created an AWS account and selected the Asia Pacific (Sydney) region. Within the default VPC there is a default security group. What settings are configured within this security group by default? (Select TWO)

1: There is an inbound rule that allows all traffic from the security group itself

2: There is an inbound rule that allows all traffic from any address

3: There is an outbound rule that allows all traffic to the security group itself

4: There is an outbound rule that allows all traffic to all addresses

5: There is an outbound rule that allows traffic to the VPC router

39. Question

A company is deploying a new two-tier web application that uses EC2 web servers and a DynamoDB database backend. An Internet facing ELB distributes connections between the web servers.

The Solutions Architect has created a security group for the web servers and needs to create a security group for the ELB. What rules should be added? (Select TWO)

1: Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as the web server security group

2: Add an Outbound rule that allows ALL TCP, and specify the destination as the Internet Gateway

3: Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as VPC CIDR

4: Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/0

5: Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/32

40. Question

A development team needs to run up a few lab servers on a weekend for a new project. The servers will need to run uninterrupted for a few hours. Which EC2 pricing option would be most suitable?

1: Spot

2: Reserved

3: On-Demand

4: Dedicated Instances

41. Question

A Solutions Architect has logged into an Amazon EC2 Linux instance using SSH and needs to determine a few pieces of information including what IAM role is assigned, the instance ID and the names of the security groups that are assigned to the instance.

From the options below, what would be the best source of this information?

1: Metadata

2: Tags

3: User data

4: Parameters

42. Question

An Amazon EC2 instance is generating very high packets-per-second and performance of the application stack is being impacted. A Solutions Architect needs to determine a resolution to the issue that results in improved performance.

Which action should the Architect take?

1: Configure a RAID 1 array from multiple EBS volumes

2: Create a placement group and put the EC2 instance in it

3: Use enhanced networking

4: Add multiple Elastic IP addresses to the instance

43. Question

A company runs a web-based application that uses Amazon EC2 instances for the web front-end and Amazon RDS for the database back-end. The web application writes transaction log files to an Amazon S3 bucket and the quantity of files is becoming quite large. It is acceptable to retain the most recent 60 days of log files and permanently delete the rest.

Which action can a Solutions Architect take to enable this to happen automatically?

1: Use an S3 lifecycle policy with object expiration configured to automatically remove objects that are more than 60 days old

2: Write a Ruby script that checks the age of objects and deletes any that are more than 60 days old

3: Use an S3 bucket policy that deletes objects that are more than 60 days old

4: Use an S3 lifecycle policy to move the log files that are more than 60 days old to the GLACIER storage class

44. Question

A Solutions Architect needs to upload a large (2GB) file to an S3 bucket. What is the recommended way to upload a single large file to an S3 bucket?

1: Use AWS Import/Export

2: Use Multipart Upload

3: Use a single PUT request to upload the large file

4: Use Amazon Snowball

45. Question

Several Amazon EC2 Spot instances are being used to process messages from an Amazon SQS queue and store results in an Amazon DynamoDB table. Shortly after picking up a message from the queue AWS terminated the Spot instance. The Spot instance had not finished processing the message. What will happen to the message?

1: The message will become available for processing again after the visibility timeout expires

2: The message will be lost as it would have been deleted from the queue when processed

3: The message will remain in the queue and be immediately picked up by another instance

4: The results may be duplicated in DynamoDB as the message will likely be processed multiple times

46. Question

A company is transitioning their web presence into the AWS cloud. As part of the migration the company will be running a web application both on-premises and in AWS for a period of time. During the period of co-existence, the client would like 80% of the traffic to hit the AWS-based web servers and 20% to be directed to the on-premises web servers.

What method can a Solutions Architect use to distribute traffic as requested?

1: Use Route 53 with a weighted routing policy and configure the respective weights

2: Use Route 53 with a simple routing policy

3: Use an Application Load Balancer to distribute traffic based on IP address

4: Use a Network Load Balancer to distribute traffic based on Instance ID

47. Question

A Solutions Architect has created a new Network ACL in an Amazon VPC. No rules have been created. Which of the statements below are correct regarding the default state of the Network ACL? (Select TWO)

1: There is a default inbound rule allowing traffic from the VPC CIDR block
2: There is a default outbound rule allowing traffic to the Internet Gateway
3: There is a default outbound rule allowing all traffic
4: There is a default inbound rule denying all traffic
5: There is a default outbound rule denying all traffic

48. Question

A company needs to capture detailed information about all HTTP requests that are processed by their Internet facing Application Load Balancer (ALB). The company requires information on the requester, IP address, and request type for analyzing traffic patterns to better understand their customer base.

Which actions should a Solutions Architect recommend?

1: Configure metrics in CloudWatch for the ALB
2: Enable EC2 detailed monitoring
3: Enable Access Logs and store the data on S3
4: Use CloudTrail to capture all API calls made to the ALB

49. Question

A Solutions Architect needs to run a PowerShell script on a fleet of Amazon EC2 instances running Microsoft Windows. The instances have already been launched in an Amazon VPC. What tool can be run from the AWS Management Console that to execute the script on all target EC2 instances?

1: AWS CodeDeploy
2: AWS Config
3: Run Command
4: AWS OpsWorks

50. Question

A company requires an Elastic Load Balancer (ELB) for an application they are planning to deploy on AWS. The application requires extremely high throughput and extremely low latencies. The connections will be made using the TCP protocol and the ELB must

support load balancing to multiple ports on an instance. Which ELB would should the company use?

1: Classic Load Balancer

2: Application Load Balancer

3: Network Load Balancer

4: Route 53

51. Question

A web application runs on a series of Amazon EC2 instances behind an Application Load Balancer (ALB). A Solutions Architect is updating the configuration with a health check and needs to select the protocol to use. What options are available? (Select TWO)

1: HTTP

2: SSL

3: HTTPS

4: TCP

5: ICMP

52. Question

A Solutions Architect is designing the disk configuration for an Amazon EC2 instance. The instance needs to support a MapReduce process that requires high throughput for a large dataset with large I/O sizes.

Which Amazon EBS volume is the MOST cost-effective solution for these requirements?

1: EBS General Purpose SSD in a RAID 1 configuration

2: EBS Throughput Optimized HDD

3: EBS Provisioned IOPS SSD

4: EBS General Purpose SSD

53. Question

An Amazon EBS-backed EC2 instance has been launched. A requirement has come up for some high-performance ephemeral storage.

How can a Solutions Architect add a new instance store volume?

1: You must shutdown the instance in order to be able to add the instance store volume

2: You must use an Elastic Network Adapter (ENA) to add instance store volumes. First, attach an ENA, and then attach the instance store volume

3: You can specify the instance store volumes for your instance only when you launch an instance

4: You can use a block device mapping to specify additional instance store volumes when you launch your instance, or you can attach additional instance store volumes after your instance is running

54. Question

A large quantity of data that is rarely accessed is being archived onto Amazon Glacier. Your CIO wants to understand the resilience of the service. Which of the statements below is correct about Amazon Glacier storage? (Select TWO)

1: Data is replicated globally

2: Provides 99.999999999% durability of archives

3: Data is resilient in the event of one entire Availability Zone destruction

4: Data is resilient in the event of one entire region destruction

5: Provides 99.9% availability of archives

55. Question

A Solutions Architect is launching an Amazon EC2 instance with multiple attached volumes by modifying the block device mapping. Which block device can be specified in a block device mapping to be used with an EC2 instance? (Select TWO)

1: EBS volume

2: EFS volume

3: Instance store volume

4: Snapshot

5: S3 bucket

56. Question

An Amazon EC2 instance behind an Elastic Load Balancer (ELB) is in the process of being de-registered. Which ELB feature is used to allow existing connections to close cleanly?

1: Sticky Sessions
2: Proxy Protocol
3: Deletion Protection
4: Connection Draining

57. Question

The load on a MySQL database running on Amazon EC2 is increasing and performance has been impacted. Which of the options below would help to increase storage performance? (Select TWO)

1: Use a larger instance size within the instance family
2: Use HDD, Cold (SC1) EBS volumes
3: Use Provisioned IOPS (I01) EBS volumes
4: Use EBS optimized instances
5: Create a RAID 1 array from multiple EBS volumes

58. Question

An application receives a high traffic load between 7:30am and 9:30am daily. The application uses an Auto Scaling group to maintain three instances most of the time but during the peak period it requires six instances.

How can a Solutions Architect configure Auto Scaling to perform a daily scale-out event at 7:30am and a scale-in event at 9:30am to account for the peak load?

1: Use a Simple scaling policy
2: Use a Scheduled scaling policy
3: Use a Dynamic scaling policy
4: Use a Step scaling policy

59. Question

An on-premise data center will be connected to an Amazon VPC by a hardware VPN that has public and VPN-only subnets. The security

team has requested that traffic hitting public subnets on AWS that's destined to on-premise applications must be directed over the VPN to the corporate firewall.

How can this be achieved?

1: In the VPN-only subnet route table, add a route that directs all Internet traffic to the virtual private gateway

2: In the public subnet route table, add a route for your remote network and specify the customer gateway as the target

3: Configure a NAT Gateway and configure all traffic to be directed via the virtual private gateway

4: In the public subnet route table, add a route for your remote network and specify the virtual private gateway as the target

60. Question

An Amazon DynamoDB table has a variable load, ranging from sustained heavy usage some days, to only having small spikes on others. The load is 80% read and 20% write. The provisioned throughput capacity has been configured to account for the heavy load to ensure throttling does not occur.

What would be the most efficient solution to optimize cost?

1: Create a CloudWatch alarm that triggers an AWS Lambda function that adjusts the provisioned throughput

2: Create a CloudWatch alarm that notifies you of increased/decreased load, and manually adjust the provisioned throughput

3: Use DynamoDB DAX to increase the performance of the database

4: Create a DynamoDB Auto Scaling scaling policy

61. Question

A Solutions Architect has created a VPC and is in the process of formulating the subnet design. The VPC will be used to host a two-tier application that will include Internet facing web servers, and internal-only DB servers. Zonal redundancy is required.

How many subnets are required to support this requirement?

1: 2 subnets

2: 6 subnets

3: 1 subnet
4: 4 subnets

62. Question

The application development team in a company have developed a Java application and saved the source code in a .war file. They would like to run the application on AWS resources and are looking for a service that can handle the provisioning and management of the underlying resources it will run on.

Which AWS service should a Solutions Architect recommend the Developers use to upload the Java source code file?

1: AWS Elastic Beanstalk
2: AWS CodeDeploy
3: AWS CloudFormation
4: AWS OpsWorks

63. Question

A Solutions Architect has created a new security group in an Amazon VPC. No rules have been created. Which of the statements below are correct regarding the default state of the security group? (Select TWO)

1: There is an outbound rule that allows all traffic to all IP addresses
2: There are no inbound rules and traffic will be implicitly denied
3: There is an inbound rule allowing traffic from the Internet to port 22 for management
4: There are is an inbound rule that allows traffic from the Internet Gateway
5: There is an outbound rule allowing traffic to the Internet Gateway

64. Question

A security officer has requested that all data associated with a specific customer is encrypted. The data resides on Elastic Block Store (EBS) volumes. Which of the following statements about using EBS encryption are correct? (Select TWO)

1: Not all EBS types support encryption
2: All attached EBS volumes must share the same encryption state

3: All instance types support encryption

4: Data in transit between an instance and an encrypted volume is also encrypted

5: There is no direct way to change the encryption state of a volume

65. Question

An organization in the agriculture sector is deploying sensors and smart devices around factory plants and fields. The devices will collect information and send it to cloud applications running on AWS.

Which AWS service will securely connect the devices to the cloud applications?

1: AWS Glue

2: AWS IoT Core

3: AWS DMS

4: AWS Lambda

SET 6: PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS

1. Question

A company runs a streaming media service and the content is stored on Amazon S3. The media catalog server pulls updated content from S3 and can issue over 1 million read operations per second for short periods. Latency must be kept under 5ms for these updates. Which solution will provide the BEST performance for the media catalog updates?

1: Update the application code to use an Amazon ElastiCache for Redis cluster

2: Implement Amazon CloudFront and cache the content at Edge Locations

3: Update the application code to use an Amazon DynamoDB Accelerator cluster

4: Implement an Instance store volume on the media catalog server

Answer: 1

Explanation:

Some applications, such as media catalog updates require high frequency reads, and consistent throughput. For such applications, customers often complement S3 with an in-memory cache, such as Amazon ElastiCache for Redis, to reduce the S3 retrieval cost and to improve performance.

ElastiCache for Redis is a fully managed, in-memory data store that provides sub-millisecond latency performance with high throughput. ElastiCache for Redis complements S3 in the following ways:

- Redis stores data in-memory, so it provides sub-millisecond latency and supports incredibly high requests per second.
- It supports key/value based operations that map well to S3 operations (for example, GET/SET => GET/PUT), making it easy to write code for both S3 and ElastiCache.
- It can be implemented as an application side cache. This allows you to use S3 as your persistent store and benefit from its durability, availability, and low cost. Your applications decide what objects to cache, when to cache them, and how to cache them.

In this example the media catalog is pulling updates from S3 so the performance between these components is what needs to be improved. Therefore, using ElastiCache to cache the content will dramatically increase the performance.

CORRECT: "Update the application code to use an Amazon ElastiCache for Redis cluster" is the correct answer.

INCORRECT: "Implement Amazon CloudFront and cache the content at Edge Locations" is incorrect. CloudFront is good for getting media closer to users but in this case we're trying to improve performance within the data center moving data from S3 to the media catalog server.

INCORRECT: "Update the application code to use an Amazon DynamoDB Accelerator cluster" is incorrect. DynamoDB Accelerator (DAX) is used with DynamoDB but is unsuitable for use with Amazon S3.

INCORRECT: "Implement an Instance store volume on the media catalog server" is incorrect. This will improve local disk performance but will not improve reads from Amazon S3.

2. Question

Three AWS accounts are owned by the same company but in different regions. Account Z has two AWS Direct Connect connections to two separate company offices. Accounts A and B require the ability to route across account Z's Direct Connect connections to each company office. A Solutions Architect has created an AWS Direct Connect gateway in account Z.

How can the required connectivity be configured?

1: Associate the Direct Connect gateway to a transit gateway in each region

2: Associate the Direct Connect gateway to a virtual private gateway in account A and B

3: Create a VPC Endpoint to the Direct Connect gateway in account A and B

4: Create a PrivateLink connection in Account Z and ENIs in accounts A and B

Answer: 2

Explanation:

You can associate an *AWS Direct Connect gateway* with either of the following gateways:

- A transit gateway when you have multiple VPCs in the same Region.
- A virtual private gateway.

In this case account Z owns the Direct Connect gateway so a VPG in accounts A and B must be associated with it to enable this configuration to work. After Account Z accepts the proposals, Account A and Account B can route traffic from their virtual private gateway to the Direct Connect gateway.

CORRECT: "Associate the Direct Connect gateway to a virtual private gateway in account A and B" is the correct answer.

INCORRECT: "Associate the Direct Connect gateway to a transit gateway in each region" is incorrect. This would be a good solution if the accounts were in VPCs within a region rather than across regions.

INCORRECT: "Create a VPC Endpoint to the Direct Connect gateway in account A and B" is incorrect. You cannot create a VPC endpoint for Direct Connect gateways.

INCORRECT: "Create a PrivateLink connection in Account Z and ENIs in accounts A and B" is incorrect. You cannot use PrivateLink connections to publish a Direct Connect gateway.

3. Question

A tool needs to analyze data stored in an Amazon S3 bucket. Processing the data takes a few seconds and results are then written to another S3 bucket. Less than 256 MB of memory is needed to run the process. What would be the MOST cost-effective compute solutions for this use case?

1: AWS Fargate tasks

2: AWS Lambda functions

3: Amazon EC2 spot instances

4: Amazon Elastic Beanstalk

Answer: 2

Explanation:

AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume. Lambda has a maximum execution time of 900 seconds and memory can be allocated up to 3008 MB. Therefore, the most cost-effective solution will be AWS Lambda.

CORRECT: "AWS Lambda functions" is the correct answer.

INCORRECT: "AWS Fargate tasks" is incorrect. Fargate runs Docker containers and is serverless. However, you do pay for the running time of the tasks so it will not be as cost-effective.

INCORRECT: "Amazon EC2 spot instances" is incorrect. EC2 instances must run continually waiting for jobs to process so even with spot this would be less cost-effective (and subject to termination).

INCORRECT: "Amazon Elastic Beanstalk" is incorrect. This services also relies on Amazon EC2 instances so would not be as cost-effective.

4. Question

An application makes calls to a REST API running on Amazon EC2 instances behind an Application Load Balancer (ALB). Most API calls complete quickly. However, a single endpoint is making API calls that require much longer to complete and this is introducing overall latency into the system. What steps can a Solutions Architect take to minimize the effects of the long-running API calls?

1: Change the EC2 instance to one with enhanced networking to reduce latency

2: Create an Amazon SQS queue and decouple the long-running API calls

3: Increase the ALB idle timeout to allow the long-running requests to complete

4: Change the ALB to a Network Load Balancer (NLB) and use SSL/TLS termination

Answer: 2

Explanation:

An Amazon Simple Queue Service (SQS) can be used to offload and decouple the long-running requests. They can then be processed asynchronously by separate EC2 instances. This is the best way to reduce the overall latency introduced by the long-running API call.

CORRECT: "Create an Amazon SQS queue and decouple the long-running API calls" is the correct answer.

INCORRECT: "Change the EC2 instance to one with enhanced networking to reduce latency" is incorrect. This will not reduce the latency of the API call as network latency is not the issue here, it is the latency of how long the API call takes to complete.

INCORRECT: "Increase the ALB idle timeout to allow the long-running requests to complete" is incorrect. The issue is not the connection being interrupted, it is that the API call takes a long time to complete.

INCORRECT: "Change the ALB to a Network Load Balancer (NLB) and use SSL/TLS termination" is incorrect. SSL/TLS termination is not of benefit here as the problem is not encryption or processing of encryption. The issue is API call latency.

5. Question

An application runs on EC2 instances in a private subnet behind an Application Load Balancer in a public subnet. The application is highly available and distributed across multiple AZs. The EC2 instances must make API calls to an internet-based service. How can the Solutions Architect enable highly available internet connectivity?

1: Create a NAT gateway and attach it to the VPC. Add a route to the gateway to each private subnet route table

2: Configure an internet gateway. Add a route to the gateway to each private subnet route table

3: Create a NAT instance in the private subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT instance

4: Create a NAT gateway in the public subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT gateway

Answer: 4

Explanation:

The only solution presented that actually works is to create a NAT gateway in the public subnet of each AZ. They must be created in the public subnet as they gain public IP addresses and use an internet gateway for internet access.

The route tables in the private subnets must then be configured with a route to the NAT gateway and then the EC2 instances will be able to access the internet (subject to security group configuration).

CORRECT: "Create a NAT gateway in the public subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT gateway" is the correct answer.

INCORRECT: "Create a NAT gateway and attach it to the VPC. Add a route to the gateway to each private subnet route table" is incorrect. You do not attach NAT gateways to VPCs, you add them to public subnets.

INCORRECT: "Configure an internet gateway. Add a route to the gateway to each private subnet route table" is incorrect. You cannot add a route to an internet gateway to a private subnet route table (private EC2 instances don't even have public IP addresses).

INCORRECT: "Create a NAT instance in the private subnet of each AZ. Update the route tables for each private subnet to direct internet-bound traffic to the NAT instance" is incorrect. You do not create NAT instances in private subnets, they must be created in public subnets.

6. Question

A legacy application is being migrated into AWS. The application has a large amount of data that is rarely accessed. When files are accessed, they are retrieved sequentially. The application will be migrated onto an Amazon EC2 instance.

What is the LEAST expensive EBS volume type for this use case?

1: Cold HDD (sc1)

2: Provisioned IOPS SSD (io1)

3: General Purpose SSD (gp2)

4: Throughput Optimized HDD (st1)

Answer: 1

Explanation:

The cold HDD (sc1) EBS volume type is the lowest cost option that is suitable for this use case. The sc1 volume type is suitable for infrequently accessed data and use cases that are oriented towards throughput like sequential data access.

CORRECT: "Cold HDD (sc1)" is the correct answer.

INCORRECT: "Provisioned IOPS SSD (io1)" is incorrect. This is the most expensive option and used for use cases that demand high IOPS.

INCORRECT: "General Purpose SSD (gp2)" is incorrect. This is a more expensive SSD volume type that is used for general use cases.

INCORRECT: "Throughput Optimized HDD (st1)" is incorrect. This is also used for throughput-oriented use cases however it is higher cost than sc1 and better for frequently accessed data.

7. Question

An application uses an Amazon RDS database and Amazon EC2 instances in a web tier. The web tier instances must not be directly accessible from the internet to improve security.

How can a Solutions Architect meet these requirements?

1: Launch the EC2 instances in a private subnet and create an Application Load Balancer in a public subnet

2: Launch the EC2 instances in a private subnet with a NAT gateway and update the route table

3: Launch the EC2 instances in a public subnet and use AWS WAF to protect the instances from internet-based attacks

4: Launch the EC2 instances in a public subnet and create an Application Load Balancer in a public subnet

Answer: 1

Explanation:

To prevent direct connectivity to the EC2 instances from the internet you can deploy your EC2 instances in a private subnet and have the ELB in a public subnet. To configure this, you must enable a public subnet in the ELB that is in the same AZ as the private subnet.

CORRECT: "Launch the EC2 instances in a private subnet and create an Application Load Balancer in a public subnet" is the correct answer.

INCORRECT: "Launch the EC2 instances in a private subnet with a NAT gateway and update the route table" is incorrect. This configuration will not allow the application to be accessible from the internet, the aim is to only prevent direct access to the EC2 instances.

INCORRECT: "Launch the EC2 instances in a public subnet and use AWS WAF to protect the instances from internet-based attacks" is incorrect. With the EC2 instances in a public subnet, direct access from the internet is possible. It only takes a security group misconfiguration or software exploit and the instance becomes vulnerable to attack.

INCORRECT: "Launch the EC2 instances in a public subnet and create an Application Load Balancer in a public subnet" is incorrect. The EC2 instances should be launched in a private subnet.

8. Question

A company runs an application on premises that stores a large quantity of semi-structured data using key-value pairs. The application code will be migrated to AWS Lambda and a highly scalable solution is required for storing the data.

Which datastore will be the best fit for these requirements?

1: Amazon EFS

2: Amazon RDS MySQL

3: Amazon EBS

4: Amazon DynamoDB

Answer: 4

Explanation:

Amazon DynamoDB is a no-SQL database that stores data using key-value pairs. It is ideal for storing large amounts of semi-structured data and is also highly scalable. This is the best solution for storing this data based on the requirements in the scenario.

CORRECT: "Amazon DynamoDB" is the correct answer.

INCORRECT: "Amazon EFS" is incorrect. The Amazon Elastic File System (EFS) is not suitable for storing key-value pairs.

INCORRECT: "Amazon RDS MySQL" is incorrect. Amazon Relational Database Service (RDS) is used for structured data as it is an SQL type of database.

INCORRECT: "Amazon EBS" is incorrect. Amazon Elastic Block Store (EBS) is a block-based storage system. You attach volumes to EC2 instances. It is not used for key-value pairs or to be used by Lambda functions.

9. Question

An application uses a MySQL database running on an Amazon EC2 instance. The application generates high I/O and constant writes to a single table on the database. Which Amazon EBS volume type will provide the MOST consistent performance and low latency?

1: General Purpose SSD (gp2)

2: Provisioned IOPS SSD (io1)

3: Throughput Optimized HDD (st1)

4: Cold HDD (sc1)

Answer: 2

Explanation:

The Provisioned IOPS SSD (io1) volume type will offer the most consistent performance and can be configured with the amount of IOPS required by the application. It will also provide the lowest latency of the options presented.

CORRECT: "Provisioned IOPS SSD (io1)" is the correct answer.

INCORRECT: "General Purpose SSD (gp2)" is incorrect. This is not the best solution for when you require high I/O, consistent performance and low latency.

INCORRECT: "Throughput Optimized HDD (st1)" is incorrect. This is a HDD type of disk and not suitable for low latency workloads that require consistent performance.

INCORRECT: "Cold HDD (sc1)" is incorrect. This is the lowest cost option and not suitable for frequently accessed workloads.

10. Question

A Solutions Architect needs to capture information about the traffic that reaches an Amazon Elastic Load Balancer. The information should include the source, destination, and protocol.

What is the most secure and reliable method for gathering this data?

1: Create a VPC flow log for each network interface associated with the ELB

2: Enable Amazon CloudTrail logging and configure packet capturing

3: Use Amazon CloudWatch Logs to review detailed logging information

4: Create a VPC flow log for the subnets in which the ELB is running

Answer: 1

Explanation:

You can use VPC Flow Logs to capture detailed information about the traffic going to and from your Elastic Load Balancer. Create a flow log for each network interface for your load balancer. There is one network interface per load balancer subnet.

CORRECT: "Create a VPC flow log for each network interface associated with the ELB" is the correct answer.

INCORRECT: "Enable Amazon CloudTrail logging and configure packet capturing" is incorrect. CloudTrail performs auditing of API actions, it does not do packet capturing.

INCORRECT: "Use Amazon CloudWatch Logs to review detailed logging information" is incorrect as this service does not record this information in CloudWatch logs.

INCORRECT: "Create a VPC flow log for the subnets in which the ELB is running" is incorrect as the more secure option is to use the ELB network interfaces.

11. Question

The Solutions Architect in charge of a critical application must ensure the Amazon EC2 instances are able to be launched in another AWS Region in the event of a disaster.

What steps should the Solutions Architect take? (Select TWO)

1: Launch instances in the second Region using the S3 API

2: Create AMIs of the instances and copy them to another Region

3: Enable cross-region snapshots for the Amazon EC2 instances

4: Launch instances in the second Region from the AMIs

5: Copy the snapshots using Amazon S3 cross-region replication

Answer: 2,4

Explanation:

You can create AMIs of the EC2 instances and then copy them across Regions. This provides a point-in-time copy of the state of the EC2 instance in the remote Region.

Once you've created AMIs of EC2 instances and copied them to the second Region, you can then launch the EC2 instances from the AMIs in that Region.

This is a good DR strategy as you have moved stateful EC2 instances to another Region.

CORRECT: "Create AMIs of the instances and copy them to another Region" is the correct answer.

CORRECT: "Launch instances in the second Region from the AMIs" is also a correct answer.

INCORRECT: "Launch instances in the second Region using the S3 API" is incorrect. Though snapshots (and EBS-backed AMIs) are stored on Amazon S3, you cannot actually access them using the S3 API. You must use the EC2 API.

INCORRECT: "Enable cross-region snapshots for the Amazon EC2 instances" is incorrect. You cannot enable "cross-region snapshots" as this is not a feature that currently exists.

INCORRECT: "Copy the snapshots using Amazon S3 cross-region replication" is incorrect. You cannot work with snapshots using Amazon S3 at all including leveraging the cross-region replication feature.

12. Question

A company needs to ensure that they can failover between AWS Regions in the event of a disaster seamlessly with minimal downtime and data loss. The applications will run in an active-active configuration.

Which DR strategy should a Solutions Architect recommend?

1: Backup and restore

2: Pilot light

3: Warm standby

4: Multi-site

Answer: 4

Explanation:

A multi-site solution runs on AWS as well as on your existing on-site infrastructure in an active- active configuration. The data replication method that you employ will be determined by the recovery point that you choose. This is either Recovery Time Objective (the maximum allowable downtime before degraded operations are restored) or Recovery Point Objective (the maximum allowable time window whereby you will accept the loss of transactions during the DR process).

CORRECT: "Multi-site" is the correct answer.

INCORRECT: "Backup and restore" is incorrect. This is the lowest cost DR approach that simply entails creating online backups of all data and applications.

INCORRECT: "Pilot light" is incorrect. With a pilot light strategy a core minimum of services are running and the remainder are only brought online during a disaster recovery situation.

INCORRECT: "Warm standby" is incorrect. The term warm standby is used to describe a DR scenario in which a scaled-down version of a fully functional environment is always running in the cloud.

13. Question

A company has launched a multi-tier application architecture. The web tier and database tier run on Amazon EC2 instances in private subnets within the same Availability Zone.

Which combination of steps should a Solutions Architect take to add high availability to this architecture? (Select TWO)

1: Create new public subnets in the same AZ for high availability and move the web tier to the public subnets

2: Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs

3: Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)

4: Create new private subnets in the same VPC but in a different AZ. Create a database using Amazon EC2 in one AZ

5: Create new private subnets in the same VPC but in a different AZ. Migrate the database to an Amazon RDS multi-AZ deployment

Answer: 2,5

Explanation:

The Solutions Architect can use Auto Scaling group across multiple AZs with an ALB in front to create an elastic and highly available architecture. Then, migrate the database to an Amazon RDS multi-AZ deployment to create HA for the database tier. This results in a fully redundant architecture that can withstand the failure of an availability zone.

CORRECT: "Create an Amazon EC2 Auto Scaling group and Application Load Balancer (ALB) spanning multiple AZs" is a correct answer.

CORRECT: "Create new private subnets in the same VPC but in a different AZ. Migrate the database to an Amazon RDS multi-AZ deployment" is also a correct answer.

INCORRECT: "Create new public subnets in the same AZ for high availability and move the web tier to the public subnets" is incorrect. If subnets share the same AZ they are not suitable for splitting your tier across them for HA as the failure of a an AZ will take out both subnets.

INCORRECT: "Add the existing web application instances to an Auto Scaling group behind an Application Load Balancer (ALB)" is incorrect. The instances are in a single AZ so the Solutions Architect should create a new auto scaling group and launch instances across multiple AZs.

INCORRECT: "Create new private subnets in the same VPC but in a different AZ. Create a database using Amazon EC2 in one AZ" is incorrect. A database in a single AZ will not be highly available.

14. Question

An on-premises server runs a MySQL database and will be migrated to the AWS Cloud. The company require a managed solution that supports high availability and automatic failover in the event of the outage of an Availability Zone (AZ).

Which solution is the BEST fit for these requirements?

1: Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon RDS MySQL Multi-AZ deployment

2: Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon EC2 MySQL Multi-AZ deployment

3: Create a snapshot of the MySQL database server and use AWS DataSync to migrate the data Amazon S3. Launch a new Amazon RDS MySQL Multi-AZ deployment from the snapshot

4: Use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon RDS MySQL. Use the Schema Conversion Tool (SCT) to enable conversion from MySQL to Amazon RDS

Answer: 1

Explanation:

The AWS DMS service can be used to directly migrate the MySQL database to an Amazon RDS Multi-AZ deployment. The entire process can be online and is managed for you. There is no need to perform schema translation between MySQL and RDS (assuming you choose the MySQL RDS engine).

CORRECT: "Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon RDS MySQL Multi-AZ deployment" is the correct answer.

INCORRECT: "Use the AWS Database Migration Service (DMS) to directly migrate the database to an Amazon EC2 MySQL Multi-AZ deployment" is incorrect as there is no such thing as “multi-AZ” on Amazon EC2 with MySQL, you must use RDS.

INCORRECT: "Create a snapshot of the MySQL database server and use AWS DataSync to migrate the data Amazon S3. Launch a new Amazon RDS MySQL Multi-AZ deployment from the snapshot" is incorrect. You cannot create a snapshot of a MySQL database server running on-premises.

INCORRECT: "Use the AWS Database Migration Service (DMS) to directly migrate the database to Amazon RDS MySQL. Use the Schema Conversion Tool (SCT) to enable conversion from MySQL to Amazon RDS" is incorrect. There is no need to convert the schema when migrating from MySQL to Amazon RDS (MySQL engine).

15. Question

The database layer of an on-premises web application is being migrated to AWS. The database currently uses an in-memory cache. A Solutions Architect must deliver a solution that supports high availability and replication for the caching layer.

Which service should the Solutions Architect recommend?

1: Amazon ElastiCache Redis

2: Amazon RDS Multi-AZ

3: Amazon ElastiCache Memcached

4: Amazon DynamoDB

Answer: 1

Explanation:

Amazon ElastiCache Redis is an in-memory database cache and supports high availability through replicas and multi-AZ.

CORRECT: "Amazon ElastiCache Redis" is the correct answer.

INCORRECT: "Amazon ElastiCache Memcached" is incorrect as it does not support high availability or multi-AZ.

INCORRECT: "Amazon RDS Multi-AZ" is incorrect. This is not an in-memory database and it not suitable for use as a caching layer.

INCORRECT: "Amazon DynamoDB" is incorrect. DynamoDB is a non-relational database, you would not use it for a caching layer. Also, the in-memory, low-latency caching for DynamoDB is implemented using DynamoDB Accelerator (DAX).

16. Question

A Solutions Architect has created an AWS Organization with several AWS accounts. Security policy requires that use of specific API actions are limited across all accounts. The Solutions Architect requires a method of centrally controlling these actions.

What is the SIMPLEST method of achieving the requirements?

1: Create a Network ACL that limits access to the services or actions and attach it to all relevant subnets

2: Create an IAM policy in the root account and attach it to users and groups in each account

3: Create cross-account roles in each account to limit access to the services and actions that are allowed

4: Create a service control policy in the root organizational unit to deny access to the services or actions

Answer: 4

Explanation:

Service control policies (SCPs) offer central control over the maximum available permissions for all accounts in your organization, allowing you to ensure your accounts stay within your organization’s access control guidelines.

CORRECT: "Create a service control policy in the root organizational unit to deny access to the services or actions" is the correct answer.

INCORRECT: "Create a Network ACL that limits access to the services or actions and attach it to all relevant subnets" is incorrect. Network ACLs control network traffic not API actions.

INCORRECT: "Create an IAM policy in the root account and attach it to users and groups in each account" is incorrect. This is not an efficient or centrally managed method of applying the security restrictions.

INCORRECT: "Create cross-account roles in each account to limit access to the services and actions that are allowed" is incorrect. This is another example of a complex and inefficient method of providing access across accounts and does not restrict API actions within the account.

17. Question

A company has a fleet of Amazon EC2 instances behind an Elastic Load Balancer (ELB) that are a mixture of c4.2xlarge instance types and c5.large instances. The load on the CPUs on the c5.large instances has been very high, often hitting 100% utilization, whereas the c4.2xlarge instances have been performing well.

What should a Solutions Architect recommend to resolve the performance issues?

1: Enable the weighted routing policy on the ELB and configure a higher weighting for the c4.2xlarge instances

2: Add all of the instances into a Placement Group

3: Change the configuration to use only c4.2xlarge instance types

4: Add more c5.large instances to spread the load more evenly

Answer: 3

Explanation:

The 2xlarge instance type provides more CPUs. The best answer is to use this instance type for all instances as the CPU utilization has been lower.

CORRECT: "Change the configuration to use only c4.2xlarge instance types" is the correct answer.

INCORRECT: "Enable the weighted routing policy on the ELB and configure a higher weighting for the c4.2xlarge instances" is incorrect. The weighted routing policy is a Route 53 feature that would not assist in this situation.

INCORRECT: "Add all of the instances into a Placement Group" is incorrect. A placement group helps provide low-latency connectivity between instances and would not help here.

INCORRECT: "Add more c5.large instances to spread the load more evenly" is incorrect. This would not help as this instance type is underperforming with high CPU utilization rates.

18. Question

A Solutions Architect created a new IAM user account for a temporary employee who recently joined the company. The user does not have permissions to perform any actions, which statement is true about newly created users in IAM?

1: They are created with no permissions

2: They are created with limited permissions

3: They are created with full permissions

4: They are created with user privileges

Answer: 1

Explanation:

Every IAM user starts with no permissions. In other words, by default, users can do nothing, not even view their own access keys. To give a user permission to do something, you can add the permission to the user (that is, attach a policy to the user). Or you can add the user to a group that has the intended permission.

CORRECT: "They are created with no permissions" is the correct answer.

INCORRECT: "They are created with limited permissions" is incorrect as they are created with no permissions.

INCORRECT: "They are created with full permissions" is incorrect as they are created with no permissions.

INCORRECT: "They are created with user privileges" is incorrect as they are created with no permissions.

19. Question

A government agency is using CloudFront for a web application that receives personally identifiable information (PII) from citizens. What feature of CloudFront applies an extra level of encryption at CloudFront edge locations to ensure the PII data is secured end-to-end?

1: Object invalidation

2: Field-level encryption

3: RTMP distribution

4: Origin access identity

Answer: 2

Explanation:

With Amazon CloudFront, you can enforce secure end-to-end connections to origin servers by using HTTPS. Field-level encryption adds an additional layer of security that lets you protect specific data throughout system processing so that only certain applications can see it.

Field-level encryption allows you to enable your users to securely upload sensitive information to your web servers. The sensitive information provided by your users is encrypted at the edge, close to the user, and remains encrypted throughout your entire application stack. This encryption ensures that only applications that need the data—and have the credentials to decrypt it—are able to do so.

CORRECT: "Field-level encryption" is the correct answer.

INCORRECT: "Object invalidation" is incorrect. Object invalidation is a method to remove objects from the cache.

INCORRECT: "RTMP distribution" is incorrect. An RTMP distribution is a method of streaming media using Adobe Flash.

INCORRECT: "Origin access identity" is incorrect. Origin access identity applies to S3 bucket origins, not web servers.

20. Question

A company has multiple Amazon VPCs that are peered with each other. The company would like to use a single Elastic Load Balancer (ELB) to route traffic to multiple EC2 instances in peered VPCs within the same region. How can this be achieved?

1: This is not possible, the instances that an ELB routes traffic to must be in the same VPC

2: This is possible using the Classic Load Balancer (CLB) if using Instance IDs

3: This is possible using the Network Load Balancer (NLB) and Application Load Balancer (ALB) if using IP addresses as targets

4: This is not possible with ELB, you would need to use Route 53

Answer: 3

Explanation:

With ALB and NLB IP addresses can be used to register:

- Instances in a peered VPC.
- AWS resources that are addressable by IP address and port.
- On-premises resources linked to AWS through Direct Connect or a VPN connection.

CORRECT: "This is possible using the Network Load Balancer (NLB) and Application Load Balancer (ALB) if using IP addresses as targets" is the correct answer.

INCORRECT: "This is not possible, the instances that an ELB routes traffic to must be in the same VPC" is incorrect. Instances can be in peered VPCs.

INCORRECT: "This is possible using the Classic Load Balancer (CLB) if using Instance IDs" is incorrect. This is not possible with the CLB.

INCORRECT: "This is not possible with ELB, you would need to use Route 53" is incorrect. This is not true, as detailed above.

21. Question

Some data has become corrupted in an Amazon RDS database. A Solutions Architect plans to use point-in-time restore to recover the data to the last known good configuration. Which of the following statements is correct about restoring an RDS database to a specific point-in-time? (Select TWO)

1: You can restore up to the last 5 minutes

2: Custom DB security groups are applied to the new DB instance

3: You can restore up to the last 1 minute

4: The default DB security group is applied to the new DB instance

5: The database restore overwrites the existing database

Answer: 1,4

Explanation:

You can restore a DB instance to a specific point in time, creating a new DB instance. When you restore a DB instance to a point in time, the default DB security group is applied to the new DB instance. If you need custom DB security groups applied to your DB instance, you must apply them explicitly using the AWS Management Console, the AWS CLI modify-db-instance command, or the Amazon RDS
API ModifyDBInstance operation after the DB instance is available.

Restored DBs will always be a new RDS instance with a new DNS endpoint and you can restore up to the last 5 minutes.

CORRECT: "You can restore up to the last 5 minutes" is a correct answer.

CORRECT: "The default DB security group is applied to the new DB instance" is also a correct answer.

INCORRECT: "Custom DB security groups are applied to the new DB instance" is incorrect. Only default DB parameters and security groups are restored – you must manually associate all other DB parameters and SGs..

INCORRECT: "You can restore up to the last 1 minute" is incorrect. You can restore up to the last 5 minutes.

INCORRECT: "The database restore overwrites the existing database" is incorrect. You cannot restore from a DB snapshot to an existing DB – a new instance is created when you restore.

22. Question

An application is generating a large amount of clickstream events data that is being stored on S3. The business needs to understand customer behavior and want to run complex analytics queries against the data.

Which AWS service can be used for this requirement?

1: Amazon RedShift

2: Amazon Neptune

3: Amazon RDS

4: Amazon Kinesis Firehose

Answer: 1

Explanation:

Amazon Redshift is a fast, fully managed data warehouse that makes it simple and cost-effective to analyze all your data using standard SQL and existing Business Intelligence (BI) tools.

RedShift is used for running complex analytic queries against petabytes of structured data, using sophisticated query optimization, columnar storage on high-performance local disks, and massively parallel query execution.

With RedShift you can load data from Amazon S3 and perform analytics queries. RedShift Spectrum can analyze data directly in Amazon S3 but was not presented as an option.

CORRECT: "Amazon RedShift" is the correct answer.

INCORRECT: "Amazon Neptune" is incorrect. Amazon Neptune is a new product that offers a fully-managed Graph database.

INCORRECT: "Amazon RDS" is incorrect. RDS is a relational database that is used for transactional workloads not analytics workloads.

INCORRECT: "Amazon Kinesis Firehose" is incorrect. Amazon Kinesis Firehose processes streaming data, not data stored on S3.

23. Question

A Solutions Architect is deploying a production application that will use several Amazon EC2 instances and run constantly on an ongoing basis. The application cannot be interrupted or restarted. Which EC2 pricing model would be best for this workload?

1: Reserved instances

2: On-demand instances

3: Spot instances

4: Flexible instances

Answer: 1

Explanation:

In this scenario for a stable process that will run constantly on an ongoing basis RIs will be the most affordable solution.

RIs provide you with a significant discount (up to 75%) compared to On-Demand instance pricing. You have the flexibility to change families, OS types, and tenancies while benefitting from RI pricing when you use Convertible RIs.

CORRECT: "Reserved instances" is the correct answer.

INCORRECT: "On-demand instances" is incorrect. On-demand is useful for short term ad-hoc requirements for which the job cannot afford to be interrupted and are typically more expensive than Spot instances.

INCORRECT: "Spot instances" is incorrect. Spot is more suited to short term jobs that can afford to be interrupted and offer the lowest price of all options.

INCORRECT: "Flexible instances" is incorrect. There’s no such thing as flexible instances.

24. Question

A customer has requested some advice on how to implement security measures in their Amazon VPC. The client has recently been the victim of some hacking attempts. The client wants to implement measures to mitigate further threats. The client has explained that the attacks always come from the same small block of IP addresses.

What would be a quick and easy measure to help prevent further attacks?

1: Use a Security Group rule that denies connections from the block of IP addresses
2: Use CloudFront's DDoS prevention features
3: Create a Bastion Host restrict all connections to the Bastion Host only
4: Use a Network ACL rule that denies connections from the block of IP addresses

Answer: 4

Explanation:

With NACLs you can have permit and deny rules. Network ACLs contain a numbered list of rules that are evaluated in order from the lowest number until the explicit deny. Network ACLs have separate inbound and outbound rules and each rule can allow or deny traffic.

CORRECT: "Use a Network ACL rule that denies connections from the block of IP addresses" is the correct answer.

INCORRECT: "Use a Security Group rule that denies connections from the block of IP addresses" is incorrect. With Security Groups you can only assign permit rules, you cannot assign deny rules.

INCORRECT: "Use CloudFront's DDoS prevention features" is incorrect. CloudFront does have DDoS prevention features but we don't know that this is a DDoS style of attack and CloudFront can only help where the traffic is using the CloudFront service to access cached content.

INCORRECT: "Create a Bastion Host restrict all connections to the Bastion Host only" is incorrect. A bastion host is typically used for admin purposes, allowing access to a single endpoint in the AWS cloud for administration using SSH/RDP. From the bastion instance you then connect to other EC2 instances in your subnets. This is not used as a method of adding security to production systems and cannot stop traffic from hitting application ports.

25. Question

An Amazon EC2 instance has been launched into an Amazon VPC. A Solutions Architect needs to ensure that instances have both a private and public DNS hostnames. Assuming settings were not changed during creation of the VPC, how will DNS hostnames be assigned by default? (Select TWO)

1: In all VPCs instances no DNS hostnames will be assigned
2: In a non-default VPC instances will be assigned a public and private DNS hostname
3: In a default VPC instances will be assigned a public and private DNS hostname
4: In a non-default VPC instances will be assigned a private but not a public DNS hostname
5: In a default VPC instances will be assigned a private but not a public DNS hostname

Answer: 3,4

Explanation:

When you launch an instance into a default VPC, we provide the instance with public and private DNS hostnames that correspond to the public IPv4 and private IPv4 addresses for the instance.

When you launch an instance into a nondefault VPC, we provide the instance with a private DNS hostname and we might provide a public DNS hostname, depending on the DNS attributes you specify for the VPC and if your instance has a public IPv4 address.

All other statements are incorrect with default settings.

CORRECT: "In a default VPC instances will be assigned a public and private DNS hostname" is the correct answer.

CORRECT: "In a non-default VPC instances will be assigned a private but not a public DNS hostname" is the correct answer.

INCORRECT: "In all VPCs instances no DNS hostnames will be assigned" is incorrect as explained above.

INCORRECT: "In a non-default VPC instances will be assigned a public and private DNS hostname" is incorrect as explained above.

INCORRECT: "In a default VPC instances will be assigned a private but not a public DNS hostname" is incorrect as explained above.

26. Question

A fleet of Amazon EC2 instances running Linux will be launched in an Amazon VPC. An application development framework and some custom software must be installed on the instances. The installation will be initiated using some scripts. What feature enables a Solutions Architect to specify the scripts the software can be installed during the EC2 instance launch?

1: Metadata

2: Run Command

3: AWS Config

4: User Data

Answer: 4

Explanation:

When you launch an instance in Amazon EC2, you have the option of passing user data to the instance that can be used to perform common automated configuration tasks and even run scripts after the instance starts. You can pass two types of user data to Amazon EC2: shell scripts and cloud-init directives

User data is data that is supplied by the user at instance launch in the form of a script and is limited to 16KB.

CORRECT: "User Data" is the correct answer.

INCORRECT: "Metadata" is incorrect. *Instance metadata* is data about your instance that you can use to configure or manage the running instance. Instance metadata is divided into categories, for example, host name, events, and security groups.

INCORRECT: "Run Command" is incorrect. The AWS Systems Manager run command is used to manage the configuration of existing instances by using remotely executed commands. User data is better for specifying scripts to run at startup.

INCORRECT: "AWS Config" is incorrect. This service is used to manage the configuration of AWS resources, it does not run scripts on instances.

27. Question

A company is investigating ways to analyze and process large amounts of data in the cloud faster, without needing to load or transform the data in a data warehouse. The data resides in Amazon S3.

Which AWS services would allow the company to query the data in place? (Select TWO)

1: Amazon S3 Select

2: Amazon Kinesis Data Streams

3: Amazon Elasticsearch

4: Amazon RedShift Spectrum

5: Amazon SWF

Answer: 1,4

Explanation:

Amazon S3 Select is designed to help analyze and process data within an object in Amazon S3 buckets, faster and cheaper. It works by providing the ability to retrieve a subset of data from an object in Amazon S3 using simple SQL expressions

Amazon Redshift Spectrum allows you to directly run SQL queries against exabytes of unstructured data in Amazon S3. No loading or transformation is required.

CORRECT: "Amazon S3 Select" is a correct answer.

CORRECT: "Amazon RedShift Spectrum" is also a correct answer.

INCORRECT: "Amazon Kinesis Data Streams" is incorrect. Amazon Kinesis Data Streams (KDS) is a massively scalable and durable real-time data streaming service. It does not allow you to perform query-in-place operations on S3.

INCORRECT: "Amazon Elasticsearch" is incorrect. Amazon Elasticsearch Service, is a fully managed service that makes it easy for you to deploy, secure, operate, and scale Elasticsearch to search, analyze, and visualize data in real-time.

INCORRECT: "Amazon SWF" is incorrect. Amazon SWF helps developers build, run, and scale background jobs that have parallel or sequential steps.

28. Question

A distribution method is required for some static files. The requests will mainly be GET requests and a high volume of GETs is expected, often exceeding 2000 per second. The files are currently stored in an S3 bucket. According to AWS best practices, how can performance be optimized?

1: Use cross-region replication to spread the load across regions
2: Use ElastiCache to cache the content
3: Integrate CloudFront with S3 to cache the content
4: Use S3 Transfer Acceleration

Answer: 3

Explanation:

Amazon S3 automatically scales to high request rates. For example, your application can achieve at least 3,500 PUT/POST/DELETE and 5,500 GET requests per second per prefix in a bucket. There are no limits to the number of prefixes in a bucket.

If your workload is mainly sending GET requests, in addition to the preceding guidelines, you should consider using Amazon CloudFront for performance optimization. By integrating CloudFront with Amazon S3, you can distribute content to your users with low latency and a high data transfer rate.

CORRECT: "Integrate CloudFront with S3 to cache the content" is the correct answer.

INCORRECT: "Use cross-region replication to spread the load across regions" is incorrect. Cross-region replication creates a replica copy in another region but should not be used for spreading read requests across regions. There will be 2 S3 endpoints and CRR is not designed for 2 way sync so this would not work well.

INCORRECT: "Use ElastiCache to cache the content" is incorrect. ElastiCache is used for caching database content not S3 content.

INCORRECT: "Use S3 Transfer Acceleration" is incorrect. Transfer Acceleration is used to accelerate object **uploads** to S3 over long distances (latency).

29. Question

An Auto Scaling group of Amazon EC2 instances behind an Elastic Load Balancer (ELB) is running in an Amazon VPC. Health checks are configured on the ASG to use EC2 status checks. The ELB has determined that an EC2 instance is unhealthy and has removed it from service. A Solutions Architect noticed that the instance is still running and has not been terminated by EC2 Auto Scaling.

What would be an explanation for this behavior?

1: The ASG is waiting for the cooldown timer to expire before terminating the instance
2: Connection draining is enabled and the ASG is waiting for in-flight requests to complete
3: The ELB health check type has not been selected for the ASG and so it is unaware that the instance has been determined to be unhealthy by the ELB and has been removed from service
4: The health check grace period has not yet expired

Answer: 3

Explanation:

If using an ELB it is best to enable ELB health checks as otherwise EC2 status checks may show an instance as being healthy that the ELB has determined is unhealthy. In this case the instance will be removed from service by the ELB but will not be terminated by Auto Scaling

More information on ASG health checks:

- By default, uses EC2 status checks.
- Can also use ELB health checks and custom health checks.
- ELB health checks are in addition to the EC2 status checks.
- If any health check returns an unhealthy status the instance will be terminated.
- With ELB an instance is marked as unhealthy if ELB reports it as OutOfService
- A healthy instance enters the InService state.
- If an instance is marked as unhealthy it will be scheduled for replacement.
- If connection draining is enabled, Auto Scaling waits for in-flight requests to complete or timeout before terminating instances.
- The health check grace period allows a period of time for a new instance to warm up before performing a health check (300 seconds by default).

CORRECT: "The ELB health check type has not been selected for the ASG and so it is unaware that the instance has been determined to be unhealthy by the ELB and has been removed from service" is the correct answer.

INCORRECT: "The ASG is waiting for the cooldown timer to expire before terminating the instance" is incorrect as the ASG does not wait for the cooldown time to expire.

INCORRECT: "Connection draining is enabled and the ASG is waiting for in-flight requests to complete" is incorrect. Connection draining is not the correct answer as the ELB has taken the instance out of service so there are no active connections.

INCORRECT: "The health check grace period has not yet expired" is incorrect. The health check grace period allows a period of time for a new instance to warm up before performing a health check.

30. Question

A financial services company regularly runs an analysis of the day's transaction costs, execution reporting, and market performance. The company currently uses third-party commercial software for provisioning, managing, monitoring, and scaling the computing jobs which utilize a large fleet of EC2 instances.

The company is seeking to reduce costs and utilize AWS services. Which AWS service could be used in place of the third-party software?

1: Amazon Athena

2: AWS Systems Manager

3: Amazon Lex

4: AWS Batch

Answer: 4

Explanation:
AWS Batch eliminates the need to operate third-party commercial or open source batch processing solutions. There is no batch software or servers to install or manage. AWS Batch manages all the infrastructure for you, avoiding the complexities of provisioning, managing, monitoring, and scaling your batch computing jobs.
CORRECT: "AWS Batch" is the correct answer.
INCORRECT: "Amazon Athena" is incorrect. Amazon Athena is an interactive query service that makes it easy to analyze data in Amazon S3 using standard SQL.
INCORRECT: "AWS Systems Manager" is incorrect. AWS Systems Manager gives you visibility and control of your infrastructure on AWS.
INCORRECT: "Amazon Lex" is incorrect. Amazon Lex is a service for building conversational interfaces into any application using voice and text.

31. Question
A customer is deploying services in a hybrid cloud model. The customer has mandated that data is transferred directly between cloud data centers, bypassing ISPs.
Which AWS service can be used to enable hybrid cloud connectivity?
1: AWS Direct Connect
2: Amazon VPC
3: IPSec VPN
4: Amazon Route 53

Answer: 1
Explanation:
With AWS Direct Connect, you can connect to all your AWS resources in an AWS Region, transfer your business-critical data directly from your datacenter, office, or colocation environment into and from AWS, bypassing your Internet service provider and removing network congestion.
CORRECT: "AWS Direct Connect" is the correct answer.
INCORRECT: "Amazon VPC" is incorrect. Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined.
INCORRECT: "IPSec VPN" is incorrect. An IPSec VPN can be used to connect to AWS however it does not bypass the ISPs or Internet.
INCORRECT: "Amazon Route 53" is incorrect. Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service.

32. Question
An Amazon Elastic File System (EFS) has been created to store data that will be accessed by a large number of Amazon EC2 instances. The data is sensitive and a Solutions Architect is creating a design for security measures to protect the data. It

is required that network traffic is restricted correctly based on firewall rules and access from hosts is restricted by user or group.

How can this be achieved with Amazon EFS? (Select TWO)

1: Use POSIX permissions to control access from hosts by user or group

2: Use AWS Web Application Firewall (WAF) to protect EFS

3: Use EFS Security Groups to control network traffic

4: Use Network ACLs to control the traffic

5: Use IAM groups to control access by user or group

Answer: 1,3

Explanation:

You can control who can administer your file system using IAM. You can control access to files and directories with POSIX-compliant user and group-level permissions. POSIX permissions allows you to restrict access from hosts by user and group. EFS Security Groups act as a firewall, and the rules you add define the traffic flow.

CORRECT: "Use POSIX permissions to control access from hosts by user or group" is the correct answer.

CORRECT: "Use EFS Security Groups to control network traffic" is the correct answer.

INCORRECT: "Use AWS Web Application Firewall (WAF) to protect EFS" is incorrect. You cannot use AWS WAF to protect EFS data using users and groups.

INCORRECT: "Use Network ACLs to control the traffic" is incorrect. You use EFS Security Groups to control network traffic to EFS, not Network ACLs.

INCORRECT: "Use IAM groups to control access by user or group" is incorrect. You do not use IAM to control access to files and directories by user and group, but you can use IAM to control who can administer the file system configuration.

33. Question

A large multi-national client has requested a design for a multi-region database. The master database will be in the EU (Frankfurt) region and databases will be located in 4 other regions to service local read traffic. The database should be a managed service including the replication.

The solution should be cost-effective and secure. Which AWS service can deliver these requirements?

1: RDS with Multi-AZ

2: EC2 instances with EBS replication

3: RDS with cross-region Read Replicas

4: ElastiCache with Redis and clustering mode enabled

Answer: 3

Explanation:

Amazon RDS Read replicas are used for read heavy DBs and replication is asynchronous. Read replicas are for workload sharing and offloading. Read replicas can be in another region (uses asynchronous replication). This solution will enable better performance for users in the other AWS regions for database queries and is a managed service.

CORRECT: "RDS with cross-region Read Replicas" is the correct answer.

INCORRECT: "RDS with Multi-AZ" is incorrect. RDS with Multi-AZ is within a region only

INCORRECT: "EC2 instances with EBS replication" is incorrect. EC2 instances with EBS replication is not a suitable solution.

INCORRECT: "ElastiCache with Redis and clustering mode enabled" is incorrect. ElastiCache is an in-memory key/value store database (more OLAP than OLTP) and is not suitable for this scenario. Clustering mod is only available within the same region.

34. Question

A Solutions Architect is designing the system monitoring and deployment layers of a serverless application. The system monitoring layer will manage system visibility through recording logs and metrics and the deployment layer will deploy the application stack and manage workload changes through a release management process.

The Architect needs to select the most appropriate AWS services for these functions. Which services and frameworks should be used for the system monitoring and deployment layers? (Select TWO)

1: Use AWS CloudTrail for consolidating system and application logs and monitoring custom metrics

2: Use AWS X-Ray to package, test, and deploy the serverless application stack

3: Use AWS SAM to package, test, and deploy the serverless application stack

4: Use Amazon CloudWatch for consolidating system and application logs and monitoring custom metrics

5: Use AWS Lambda to package, test, and deploy the serverless application stack

Answer: 3,4

Explanation:

AWS Serverless Application Model (AWS SAM) is an extension of AWS CloudFormation that is used to package, test, and deploy serverless applications.

With Amazon CloudWatch, you can access system metrics on all the AWS services you use, consolidate system and application level logs, and create business key performance indicators (KPIs) as custom metrics for your specific needs.

CORRECT: "Use AWS SAM to package, test, and deploy the serverless application stack" is a correct answer.

CORRECT: "Use Amazon CloudWatch for consolidating system and application logs and monitoring custom metrics" is also a correct answer.

INCORRECT: "Use AWS CloudTrail for consolidating system and application logs and monitoring custom metrics" is incorrect as CloudTrail is used for auditing not performance monitoring.

INCORRECT: "Use AWS X-Ray to package, test, and deploy the serverless application stack" is incorrect. AWS X-Ray lets you analyze and debug serverless applications by providing distributed tracing and service maps to easily identify performance bottlenecks by visualizing a request end-to-end.

INCORRECT: "Use AWS Lambda to package, test, and deploy the serverless application stack" is incorrect. AWS Lambda is used for executing your code as functions, it is not used for packaging, testing and deployment. AWS Lambda is used with AWS SAM.

35. Question

One of the departments in a company has been generating a large amount of data on Amazon S3 and costs are increasing. Data older than 90 days is rarely accessed but must be retained for several years. If this data does need to be accessed at least 24 hours notice is provided.

How can a Solutions Architect optimize the costs associated with storage of this data whilst ensuring it is accessible if required?

1: Implement archival software that automatically moves the data to tape

2: Use S3 lifecycle policies to move data to the STANDARD_IA storage class

3: Use S3 lifecycle policies to move data to GLACIER after 90 days

4: Select the older data and manually migrate it to GLACIER

Answer: 3

Explanation:

To manage your objects so that they are stored cost effectively throughout their lifecycle, configure their lifecycle. A lifecycle configuration is a set of rules that define actions that Amazon S3 applies to a group of objects. Transition actions define when objects transition to another storage class.

For example, you might choose to transition objects to the STANDARD_IA storage class 30 days after you created them, or archive objects to the GLACIER storage class one year after creating them.

GLACIER retrieval times:

- Standard retrieval is 3-5 hours which is well within the requirements here.
- You can use Expedited retrievals to access data in 1 – 5 minutes.
- You can use Bulk retrievals to access up to petabytes of data in approximately 5 – 12 hours.

CORRECT: "Use S3 lifecycle policies to move data to GLACIER after 90 days" is the correct answer.

INCORRECT: "Implement archival software that automatically moves the data to tape" is incorrect as this solution can be fully automated using lifecycle policies.

INCORRECT: "Use S3 lifecycle policies to move data to the STANDARD_IA storage class" is incorrect. STANDARD_IA is good for infrequently accessed data and provides faster access times than GLACIER but is more expensive so not the best option here.

INCORRECT: "Select the older data and manually migrate it to GLACIER" is incorrect as a lifecycle policy can automate the process.

36. Question

A Solutions Architect enabled Access Logs on an Application Load Balancer (ALB) and needs to process the log files using a hosted Hadoop service. What configuration changes and services can be leveraged to deliver this requirement?

1: Configure Access Logs to be delivered to EC2 and install Hadoop for processing the log files

2: Configure Access Logs to be delivered to DynamoDB and use EMR for processing the log files

3: Configure Access Logs to be delivered to S3 and use Kinesis for processing the log files

4: Configure Access Logs to be delivered to S3 and use EMR for processing the log files

Answer: 4

Explanation:

Access Logs can be enabled on ALB and configured to store data in an S3 bucket. Amazon EMR is a web service that enables businesses, researchers, data analysts, and developers to easily and cost-effectively process vast amounts of data. EMR utilizes a hosted Hadoop framework running on Amazon EC2 and Amazon S3.

CORRECT: "Configure Access Logs to be delivered to S3 and use EMR for processing the log files" is the correct answer.

INCORRECT: "Configure Access Logs to be delivered to EC2 and install Hadoop for processing the log files" is incorrect. EC2 does not provide a hosted Hadoop service.

INCORRECT: "Configure Access Logs to be delivered to DynamoDB and use EMR for processing the log files" is incorrect. You cannot configure access logs to be delivered to DynamoDB.

INCORRECT: "Configure Access Logs to be delivered to S3 and use Kinesis for processing the log files" is incorrect. Kinesis does not provide a hosted Hadoop service.

37. Question

A web application receives order processing information from customers and places the messages on an Amazon SQS queue. A fleet of Amazon EC2 instances are configured to pick up the messages, process them, and store the results in a

DynamoDB table. The current configuration has been resulting in a large number of empty responses to ReceiveMessage API requests.

A Solutions Architect needs to eliminate empty responses to reduce operational overhead. How can this be done?

1: Use a Standard queue to provide at-least-once delivery, which means that each message is delivered at least once

2: Use a FIFO (first-in-first-out) queue to preserve the exact order in which messages are sent and received

3: Configure Long Polling to eliminate empty responses by allowing Amazon SQS to wait until a message is available in a queue before sending a response

4: Configure Short Polling to eliminate empty responses by reducing the length of time a connection request remains open

Answer: 3

Explanation:

The correct answer is to use Long Polling which will eliminate empty responses by allowing Amazon SQS to wait until a message is available in a queue before sending a response.

The problem does not relate to the order in which the messages are processed in and there are no concerns over messages being delivered more than once so it doesn't matter whether you use a FIFO or standard queue.

Long Polling:

- Uses fewer requests and reduces cost.
- Eliminates false empty responses by querying all servers.
- SQS waits until a message is available in the queue before sending a response.

Short Polling:

- Does not wait for messages to appear in the queue.
- It queries only a subset of the available servers for messages (based on weighted random execution).
- Short polling is the default.
- ReceiveMessageWaitTime is set to 0.

CORRECT: "Configure Long Polling to eliminate empty responses by allowing Amazon SQS to wait until a message is available in a queue before sending a response" is the correct answer.

INCORRECT: "Use a Standard queue to provide at-least-once delivery, which means that each message is delivered at least once" is incorrect as explained above.

INCORRECT: "Use a FIFO (first-in-first-out) queue to preserve the exact order in which messages are sent and received" is incorrect as explained above.

INCORRECT: "Configure Short Polling to eliminate empty responses by reducing the length of time a connection request remains open" is incorrect as explained above.

38. Question

A Solutions Architect has created an AWS account and selected the Asia Pacific (Sydney) region. Within the default VPC there is a default security group. What settings are configured within this security group by default? (Select TWO)

1: There is an inbound rule that allows all traffic from the security group itself

2: There is an inbound rule that allows all traffic from any address

3: There is an outbound rule that allows all traffic to the security group itself

4: There is an outbound rule that allows all traffic to all addresses

5: There is an outbound rule that allows traffic to the VPC router

Answer: 1,4

Explanation:

Default security groups have inbound allow rules (allowing traffic from within the group) whereas custom security groups do not have inbound allow rules (all inbound traffic is denied by default). All outbound traffic is allowed by default in custom and default security groups.

CORRECT: "There is an inbound rule that allows all traffic from the security group itself" is a correct answer.

CORRECT: "There is an outbound rule that allows all traffic to all addresses" is also a correct answer.

INCORRECT: "There is an inbound rule that allows all traffic from any address" is incorrect as explained above.

INCORRECT: "There is an outbound rule that allows all traffic to the security group itself" is incorrect as explained above.

INCORRECT: "There is an outbound rule that allows traffic to the VPC router" is incorrect as explained above.

39. Question

A company is deploying a new two-tier web application that uses EC2 web servers and a DynamoDB database backend. An Internet facing ELB distributes connections between the web servers.

The Solutions Architect has created a security group for the web servers and needs to create a security group for the ELB. What rules should be added? (Select TWO)

1: Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as the web server security group

2: Add an Outbound rule that allows ALL TCP, and specify the destination as the Internet Gateway

3: Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as VPC CIDR

4: Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/0

5: Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/32

Answer: 1,4

Explanation:

An inbound rule should be created for the relevant protocols (HTTP/HTTPS) and the source should be set to any address (0.0.0.0/0).

The outbound rule should forward the relevant protocols (HTTP/HTTPS) and the destination should be set to the web server security group.

Note that on the web server security group you'd want to add an Inbound rule allowing HTTP/HTTPS from the ELB security group.

CORRECT: "Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as the web server security group" is a correct answer.

CORRECT: "Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/0" is also a correct answer.

INCORRECT: "Add an Outbound rule that allows ALL TCP, and specify the destination as the Internet Gateway" is incorrect as the relevant protocol should be specified and the destination should be the web server security group.

INCORRECT: "Add an Outbound rule that allows HTTP/HTTPS, and specify the destination as VPC CIDR" is incorrect. Using the VPC CIDR would not be secure and you cannot specify an Internet Gateway in a security group (not that you'd want to anyway).

INCORRECT: "Add an Inbound rule that allows HTTP/HTTPS, and specify the source as 0.0.0.0/32" is incorrect. The address 0.0.0.0/32 is incorrect as the 32 mask means an exact match is required (0.0.0.0).

40. Question

A development team needs to run up a few lab servers on a weekend for a new project. The servers will need to run uninterrupted for a few hours. Which EC2 pricing option would be most suitable?

1: Spot

2: Reserved

3: On-Demand

4: Dedicated Instances

Answer: 3

Explanation:

On-Demand pricing ensures that instances will not be terminated and is the most economical option. Use on-demand for ad-hoc requirements where you cannot tolerate interruption.

CORRECT: "On-Demand" is the correct answer.

INCORRECT: "Spot" is incorrect. Spot pricing may be the most economical option for a short duration over a weekend but you may have the instances terminated by AWS and

there is a requirement that the servers run uninterrupted.

INCORRECT: "Reserved" is incorrect. Reserved pricing provides a reduced cost for a contracted period (1 or 3 years), and is not suitable for ad hoc requirements.

INCORRECT: "Dedicated instances" is incorrect. Dedicated instances run on hardware that's dedicated to a single customer and are more expensive than regular On-Demand instances.

41. Question

A Solutions Architect has logged into an Amazon EC2 Linux instance using SSH and needs to determine a few pieces of information including what IAM role is assigned, the instance ID and the names of the security groups that are assigned to the instance.

From the options below, what would be the best source of this information?

1: Metadata

2: Tags

3: User data

4: Parameters

Answer:

Explanation:

Instance metadata is data about your instance that you can use to configure or manage the running instance. Instance metadata is divided into categories, for example, host name, events, and security groups.

Instance metadata is available at http://169.254.169.254/latest/meta-data.

CORRECT: "Metadata" is the correct answer.

INCORRECT: "Tags" is incorrect. Tags are used to categorize and label resources.

INCORRECT: "User data" is incorrect. User data is used to configure the system at launch time and specify scripts.

INCORRECT: "Parameters" is incorrect. Parameters are used in databases.

42. Question

An Amazon EC2 instance is generating very high packets-per-second and performance of the application stack is being impacted. A Solutions Architect needs to determine a resolution to the issue that results in improved performance.

Which action should the Architect take?

1: Configure a RAID 1 array from multiple EBS volumes

2: Create a placement group and put the EC2 instance in it

3: Use enhanced networking

4: Add multiple Elastic IP addresses to the instance

Answer: 3

Explanation:

Enhanced networking provides higher bandwidth, higher packet-per-second (PPS) performance, and consistently lower inter-instance latencies. If your packets-per-second rate appears to have reached its ceiling, you should consider moving to enhanced networking because you have likely reached the upper thresholds of the VIF driver. It is only available for certain instance types and only supported in VPC. You must also launch an HVM AMI with the appropriate drivers

AWS currently supports enhanced networking capabilities using SR-IOV. SR-IOV provides direct access to network adapters, provides higher performance (packets-per-second) and lower latency.

CORRECT: "Use enhanced networking" is the correct answer.

INCORRECT: "Configure a RAID 1 array from multiple EBS volumes" is incorrect. You do not need to create a RAID 1 array (which is more for redundancy than performance anyway).

INCORRECT: "Create a placement group and put the EC2 instance in it" is incorrect. A placement group is used to increase network performance between instances. In this case there is only a single instance so it won't help.

INCORRECT: "Add multiple Elastic IP addresses to the instance" is incorrect. Adding multiple IP addresses is not a way to increase performance of the instance as the same amount of bandwidth is available to the Elastic Network Interface (ENI).

43. Question

A company runs a web-based application that uses Amazon EC2 instances for the web front-end and Amazon RDS for the database back-end. The web application writes transaction log files to an Amazon S3 bucket and the quantity of files is becoming quite large. It is acceptable to retain the most recent 60 days of log files and permanently delete the rest.

Which action can a Solutions Architect take to enable this to happen automatically?

1: Use an S3 lifecycle policy with object expiration configured to automatically remove objects that are more than 60 days old

2: Write a Ruby script that checks the age of objects and deletes any that are more than 60 days old

3: Use an S3 bucket policy that deletes objects that are more than 60 days old

4: Use an S3 lifecycle policy to move the log files that are more than 60 days old to the GLACIER storage class

Answer: 1

Explanation:

To manage your objects so that they are stored cost effectively throughout their lifecycle, configure their Amazon S3 Lifecycle. An S3 Lifecycle configuration is a set of rules that

define actions that Amazon S3 applies to a group of objects. There are two types of actions:

- Transition actions—Define when objects transition to another storage class. For example, you might choose to transition objects to the S3 Standard-IA storage class 30 days after you created them, or archive objects to the S3 Glacier storage class one year after creating them.
- Expiration actions—Define when objects expire. Amazon S3 deletes expired objects on your behalf.

CORRECT: "Use an S3 lifecycle policy with object expiration configured to automatically remove objects that are more than 60 days old" is the correct answer.

INCORRECT: "Write a Ruby script that checks the age of objects and deletes any that are more than 60 days old" is incorrect as the automated method is to use object expiration.

INCORRECT: "Use an S3 bucket policy that deletes objects that are more than 60 days old" is incorrect as you cannot do this with bucket policies.

INCORRECT: "Use an S3 lifecycle policy to move the log files that are more than 60 days old to the GLACIER storage class" is incorrect. Moving logs to Glacier may save cost but the question requests that the files are permanently deleted.

44. Question

A Solutions Architect needs to upload a large (2GB) file to an S3 bucket. What is the recommended way to upload a single large file to an S3 bucket?

1: Use AWS Import/Export

2: Use Multipart Upload

3: Use a single PUT request to upload the large file

4: Use Amazon Snowball

Answer: 2

Explanation:

In general, when your object size reaches 100 MB, you should consider using multipart uploads instead of uploading the object in a single operation.

CORRECT: "Use Multipart Upload" is the correct answer.

INCORRECT: "Use AWS Import/Export" is incorrect. AWS Import/Export is a service in which you send in HDDs with data on to AWS and they import your data into S3. It is not used for single files.

INCORRECT: "Use a single PUT request to upload the large file" is incorrect. The largest object that can be uploaded in a single PUT is 5 gigabytes.

INCORRECT: "Use Amazon Snowball" is incorrect. Snowball is used for migrating large quantities (TB/PB) of data into AWS, it is overkill for this requirement.

45. Question

Several Amazon EC2 Spot instances are being used to process messages from an Amazon SQS queue and store results in an Amazon DynamoDB table. Shortly after picking up a message from the queue AWS terminated the Spot instance. The Spot instance had not finished processing the message. What will happen to the message?

1: The message will become available for processing again after the visibility timeout expires

2: The message will be lost as it would have been deleted from the queue when processed

3: The message will remain in the queue and be immediately picked up by another instance

4: The results may be duplicated in DynamoDB as the message will likely be processed multiple times

Answer: 1

Explanation:

The visibility timeout is the amount of time a message is invisible in the queue after a reader picks up the message. If a job is processed within the visibility timeout the message will be deleted. If a job is not processed within the visibility timeout the message will become visible again (could be delivered twice). The maximum visibility timeout for an Amazon SQS message is 12 hours.

CORRECT: "The message will become available for processing again after the visibility timeout expires" is the correct answer.

INCORRECT: "The message will be lost as it would have been deleted from the queue when processed" is incorrect. The message will not be lost and will not be immediately picked up by another instance.

INCORRECT: "The message will remain in the queue and be immediately picked up by another instance" is incorrect. As mentioned above it will be available for processing in the queue again after the timeout expires.

INCORRECT: "The results may be duplicated in DynamoDB as the message will likely be processed multiple times" is incorrect. As the instance had not finished processing the message it should only be fully processed once. Depending on your application process however it is possible some data was written to DynamoDB.

46. Question

A company is transitioning their web presence into the AWS cloud. As part of the migration the company will be running a web application both on-premises and in AWS for a period of time. During the period of co-existence, the client would like 80% of the traffic to hit the AWS-based web servers and 20% to be directed to the on-premises web servers.

What method can a Solutions Architect use to distribute traffic as requested?

1: Use Route 53 with a weighted routing policy and configure the respective weights

2: Use Route 53 with a simple routing policy

3: Use an Application Load Balancer to distribute traffic based on IP address
4: Use a Network Load Balancer to distribute traffic based on Instance ID

Answer: 1

Explanation:

Route 53 weighted routing policy is similar to simple but you can specify a weight per IP address. You create records that have the same name and type and assign each record a relative weight which is a numerical value that favors one IP over another (values must total 100). To stop sending traffic to a resource you can change the weight of the record to 0.

CORRECT: "Use Route 53 with a weighted routing policy and configure the respective weights" is the correct answer.

INCORRECT: "Use Route 53 with a simple routing policy" is incorrect as this will not split traffic based on weights as required.

INCORRECT: "Use an Application Load Balancer to distribute traffic based on IP address" is incorrect. Application Load Balancer can distribute traffic to AWS and on-premise resources using IP addresses but cannot be used to distribute traffic in a weighted manner.

INCORRECT: "Use a Network Load Balancer to distribute traffic based on Instance ID" is incorrect. Network Load Balancer can distribute traffic to AWS and on-premise resources using IP addresses (not Instance IDs).

47. Question

A Solutions Architect has created a new Network ACL in an Amazon VPC. No rules have been created. Which of the statements below are correct regarding the default state of the Network ACL? (Select TWO)

1: There is a default inbound rule allowing traffic from the VPC CIDR block
2: There is a default outbound rule allowing traffic to the Internet Gateway
3: There is a default outbound rule allowing all traffic
4: There is a default inbound rule denying all traffic
5: There is a default outbound rule denying all traffic

Answer: 4,5

Explanation:

A VPC automatically comes with a default network ACL which allows all inbound/outbound traffic. A custom NACL denies all traffic both inbound and outbound by default.

Network ACL's function at the subnet level and you can have permit and deny rules. Network ACLs have separate inbound and outbound rules and each rule can allow or deny traffic.

Network ACLs are stateless so responses are subject to the rules for the direction of traffic. NACLs only apply to traffic that is ingress or egress to the subnet not to traffic within the subnet.

CORRECT: "There is a default inbound rule denying all traffic" is a correct answer.

CORRECT: "There is a default outbound rule denying all traffic" is also a correct answer.

INCORRECT: "There is a default inbound rule allowing traffic from the VPC CIDR block" is incorrect as inbound traffic is not allowed from anywhere by default.

INCORRECT: "There is a default outbound rule allowing traffic to the Internet Gateway" is incorrect as outbound traffic is not allowed to anywhere by default.

INCORRECT: "There is a default outbound rule allowing all traffic" is incorrect as all traffic is denied.

48. Question

A company needs to capture detailed information about all HTTP requests that are processed by their Internet facing Application Load Balancer (ALB). The company requires information on the requester, IP address, and request type for analyzing traffic patterns to better understand their customer base.

Which actions should a Solutions Architect recommend?

1: Configure metrics in CloudWatch for the ALB

2: Enable EC2 detailed monitoring

3: Enable Access Logs and store the data on S3

4: Use CloudTrail to capture all API calls made to the ALB

Answer: 3

Explanation:

You can enable access logs on the ALB and this will provide the information required including requester, IP, and request type. Access logs are not enabled by default. You can optionally store and retain the log files on S3.

CORRECT: "Enable Access Logs and store the data on S3" is the correct answer.

INCORRECT: "Configure metrics in CloudWatch for the ALB" is incorrect. CloudWatch is used for performance monitoring and CloudTrail is used for auditing API access.

INCORRECT: "Enable EC2 detailed monitoring" is incorrect. Enabling EC2 detailed monitoring will not capture the information requested.

INCORRECT: Use CloudTrail to capture all API calls made to the ALB"" is incorrect. CloudTrail captures API activity and would not include the requested information.

49. Question

A Solutions Architect needs to run a PowerShell script on a fleet of Amazon EC2 instances running Microsoft Windows. The instances have already been launched in

an Amazon VPC. What tool can be run from the AWS Management Console that to execute the script on all target EC2 instances?

1: AWS CodeDeploy

2: AWS Config

3: Run Command

4: AWS OpsWorks

Answer: 3

Explanation:

Run Command is designed to support a wide range of enterprise scenarios including installing software, running ad hoc scripts or Microsoft PowerShell commands, configuring Windows Update settings, and more.

Run Command can be used to implement configuration changes across Windows instances on a consistent yet ad hoc basis and is accessible from the AWS Management Console, the AWS Command Line Interface (CLI), the AWS Tools for Windows PowerShell, and the AWS SDKs.

CORRECT: "Run Command" is the correct answer.

INCORRECT: "AWS CodeDeploy" is incorrect. AWS CodeDeploy is a deployment service that automates application deployments to Amazon EC2 instances, on-premises instances, serverless Lambda functions, or Amazon ECS services.

INCORRECT: "AWS Config" is incorrect. AWS Config is a service that enables you to assess, audit, and evaluate the configurations of your AWS resources. It is not used for ad-hoc script execution.

INCORRECT: "AWS OpsWorks" is incorrect. AWS OpsWorks provides instances of managed Puppet and Chef.

50. Question

A company requires an Elastic Load Balancer (ELB) for an application they are planning to deploy on AWS. The application requires extremely high throughput and extremely low latencies. The connections will be made using the TCP protocol and the ELB must support load balancing to multiple ports on an instance. Which ELB would should the company use?

1: Classic Load Balancer

2: Application Load Balancer

3: Network Load Balancer

4: Route 53

Answer: 3

Explanation:

The Network Load Balancer operates at the connection level (Layer 4), routing connections to targets – Amazon EC2 instances, containers and IP addresses based

on IP protocol data. It is architected to handle millions of requests/sec, sudden volatile traffic patterns and provides extremely low latencies.

The NLB provides high throughput and extremely low latencies and is designed to handle traffic as it grows and can load balance millions of requests/second. NLB also supports load balancing to multiple ports on an instance.

CORRECT: "Network Load Balancer" is the correct answer.

INCORRECT: "Classic Load Balancer" is incorrect. The CLB operates using the TCP, SSL, HTTP and HTTPS protocols. It is not the best choice for requirements of extremely high throughput and low latency and does not support load balancing to multiple ports on an instance.

INCORRECT: "Application Load Balancer" is incorrect. The ALB operates at the HTTP and HTTPS level only (does not support TCP load balancing).

INCORRECT: "Route 53" is incorrect. Route 53 is a DNS service, it is not a type of ELB (though you can do some types of load balancing with it).

51. Question

A web application runs on a series of Amazon EC2 instances behind an Application Load Balancer (ALB). A Solutions Architect is updating the configuration with a health check and needs to select the protocol to use. What options are available? (Select TWO)

1: HTTP

2: SSL

3: HTTPS

4: TCP

5: ICMP

Answer: 1,3

Explanation:

An Application Load Balancer periodically sends requests to its registered targets to test their status. These tests are called *health checks* .

Each load balancer node routes requests only to the healthy targets in the enabled Availability Zones for the load balancer. Each load balancer node checks the health of each target, using the health check settings for the target groups with which the target is registered. After your target is registered, it must pass one health check to be considered healthy. After each health check is completed, the load balancer node closes the connection that was established for the health check.

If a target group contains only unhealthy registered targets, the load balancer nodes route requests across its unhealthy targets.

For an ALB the possible protocols are HTTP and HTTPS. The default is the HTTP protocol.

CORRECT: "HTTP" is the correct answer.

CORRECT: "HTTPS" is the correct answer.
INCORRECT: "SSL" is incorrect as this is not supported by the ALB.
INCORRECT: "TCP" is incorrect as this is not supported by the ALB.
INCORRECT: "ICMP" is incorrect as this is not supported by the ALB.

52. Question

A Solutions Architect is designing the disk configuration for an Amazon EC2 instance. The instance needs to support a MapReduce process that requires high throughput for a large dataset with large I/O sizes.

Which Amazon EBS volume is the MOST cost-effective solution for these requirements?

1: EBS General Purpose SSD in a RAID 1 configuration
2: EBS Throughput Optimized HDD
3: EBS Provisioned IOPS SSD
4: EBS General Purpose SSD

Answer: 2

Explanation:

EBS Throughput Optimized HDD is good for the following use cases (and is the most cost-effective option:

- Frequently accessed, throughput intensive workloads with large datasets and large I/O sizes, such as MapReduce, Kafka, log processing, data warehouse, and ETL workloads

Throughput is measured in MB/s, and includes the ability to burst up to 250 MB/s per TB, with a baseline throughput of 40 MB/s per TB and a maximum throughput of 500 MB/s per volume.

CORRECT: "EBS Throughput Optimized HDD" is the correct answer.
INCORRECT: "EBS General Purpose SSD in a RAID 1 configuration" is incorrect. This is not the best solution for the requirements or the most cost-effective.
INCORRECT: "EBS Provisioned IOPS SSD" is incorrect. SSD disks are more expensive.
INCORRECT: "EBS General Purpose SSD" is incorrect. SSD disks are more expensive.

53. Question

An Amazon EBS-backed EC2 instance has been launched. A requirement has come up for some high-performance ephemeral storage.

How can a Solutions Architect add a new instance store volume?

1: You must shutdown the instance in order to be able to add the instance store volume
2: You must use an Elastic Network Adapter (ENA) to add instance store volumes. First, attach an ENA, and then attach the instance store volume

3: You can specify the instance store volumes for your instance only when you launch an instance

4: You can use a block device mapping to specify additional instance store volumes when you launch your instance, or you can attach additional instance store volumes after your instance is running

Answer: 3

Explanation:

You can specify the instance store volumes for your instance only when you launch an instance. You can't attach instance store volumes to an instance after you've launched it.

CORRECT: "You can specify the instance store volumes for your instance only when you launch an instance" is the correct answer.

INCORRECT: "You must shutdown the instance in order to be able to add the instance store volume" is incorrect. You can use a block device mapping to specify additional EBS volumes when you launch your instance, or you can attach additional EBS volumes after your instance is running.

INCORRECT: "You must use an Elastic Network Adapter (ENA) to add instance store volumes. First, attach an ENA, and then attach the instance store volume" is incorrect. An Elastic Network Adapter has nothing to do with adding instance store volumes.

INCORRECT: "You can use a block device mapping to specify additional instance store volumes when you launch your instance, or you can attach additional instance store volumes after your instance is running" is incorrect. You can't attach instance store volumes to an instance after you've launched it.

54. Question

A large quantity of data that is rarely accessed is being archived onto Amazon Glacier. Your CIO wants to understand the resilience of the service. Which of the statements below is correct about Amazon Glacier storage? (Select TWO)

1: Data is replicated globally

2: Provides 99.999999999% durability of archives

3: Data is resilient in the event of one entire Availability Zone destruction

4: Data is resilient in the event of one entire region destruction

5: Provides 99.9% availability of archives

Answer: 2,3

Explanation:

Glacier is designed for durability of 99.999999999% of objects across multiple Availability Zones. Data is resilient in the event of one entire Availability Zone destruction. Glacier supports SSL for data in transit and encryption of data at rest. Glacier is extremely low cost and is ideal for long-term archival.

CORRECT: "Provides 99.999999999% durability of archives" is the correct answer.

CORRECT: "Data is resilient in the event of one entire Availability Zone destruction" is the correct answer.

INCORRECT: "Data is replicated globally" is incorrect. Data is not replicated globally.

INCORRECT: "Data is resilient in the event of one entire region destruction" is incorrect. Data is not resilient to the failure of an entire region.

INCORRECT: "Provides 99.9% availability of archives" is incorrect. Glacier is "designed for" availability of **99.99%**

55. Question

A Solutions Architect is launching an Amazon EC2 instance with multiple attached volumes by modifying the block device mapping. Which block device can be specified in a block device mapping to be used with an EC2 instance? (Select TWO)

1: EBS volume

2: EFS volume

3: Instance store volume

4: Snapshot

5: S3 bucket

Answer: 1,3

Explanation:

Each instance that you launch has an associated root device volume, either an Amazon EBS volume or an instance store volume.

You can use block device mapping to specify additional EBS volumes or instance store volumes to attach to an instance when it's launched. You can also attach additional EBS volumes to a running instance.

You cannot use a block device mapping to specify a snapshot, EFS volume or S3 bucket.

CORRECT: "EBS volume" is a correct answer.

CORRECT: "Instance store volume" is also a correct answer.

INCORRECT: "EFS volume" is incorrect as described above.

INCORRECT: "Snapshot" is incorrect as described above.

INCORRECT: "S3 bucket" is incorrect as described above.

56. Question

An Amazon EC2 instance behind an Elastic Load Balancer (ELB) is in the process of being de-registered. Which ELB feature is used to allow existing connections to close cleanly?

1: Sticky Sessions

2: Proxy Protocol

3: Deletion Protection

4: Connection Draining

Answer: 4

Explanation:

Connection draining is enabled by default and provides a period of time for existing connections to close cleanly. When connection draining is in action an CLB will be in the status “InService: Instance deregistration currently in progress”.

CORRECT: "Connection Draining" is the correct answer.

INCORRECT: "Sticky Sessions" is incorrect. Session stickiness uses cookies and ensures a client is bound to an individual back-end instance for the duration of the cookie lifetime.

INCORRECT: "Proxy Protocol" is incorrect. The Proxy Protocol header helps you identify the IP address of a client when you have a load balancer that uses TCP for back-end connections.

INCORRECT: "Deletion Protection" is incorrect. Deletion protection is used to protect the ELB from deletion.

57. Question

The load on a MySQL database running on Amazon EC2 is increasing and performance has been impacted. Which of the options below would help to increase storage performance? (Select TWO)

1: Use a larger instance size within the instance family

2: Use HDD, Cold (SC1) EBS volumes

3: Use Provisioned IOPS (I01) EBS volumes

4: Use EBS optimized instances

5: Create a RAID 1 array from multiple EBS volumes

Answer: 3,4

Explanation:

EBS optimized instances provide dedicated capacity for Amazon EBS I/O. EBS optimized instances are designed for use with all EBS volume types.

Provisioned IOPS EBS volumes allow you to specify the amount of IOPS you require up to 50 IOPS per GB. Within this limitation you can therefore choose to select the IOPS required to improve the performance of your volume.

RAID can be used to increase IOPS, however RAID 1 does not. For example:

- RAID 0 = 0 striping – data is written across multiple disks and increases performance but no redundancy.
- RAID 1 = 1 mirroring – creates 2 copies of the data but does not increase performance, only redundancy.

HDD, Cold – (SC1) provides the lowest cost storage and low performance

CORRECT: "Use Provisioned IOPS (I01) EBS volumes" is a correct answer.

CORRECT: "Use EBS optimized instances" is also a correct answer.

INCORRECT: "Use a larger instance size within the instance family" is incorrect as this may not increase storage performance.

INCORRECT: "Use HDD, Cold (SC1) EBS volumes" is incorrect. As this will likely decrease storage performance.

INCORRECT: "Create a RAID 1 array from multiple EBS volumes" is incorrect. As explained above, mirroring does not increase performance.

58. Question

An application receives a high traffic load between 7:30am and 9:30am daily. The application uses an Auto Scaling group to maintain three instances most of the time but during the peak period it requires six instances.

How can a Solutions Architect configure Auto Scaling to perform a daily scale-out event at 7:30am and a scale-in event at 9:30am to account for the peak load?

1: Use a Simple scaling policy

2: Use a Scheduled scaling policy

3: Use a Dynamic scaling policy

4: Use a Step scaling policy

Answer: 2

Explanation:

The following scaling policy options are available:

Simple – maintains a current number of instances, you can manually change the ASGs min/desired/max and attach/detach instances.

Scheduled – Used for predictable load changes, can be a single event or a recurring schedule

Dynamic (event based) – scale in response to an event/alarm.

Step – configure multiple scaling steps in response to multiple alarms.

CORRECT: "Use a Scheduled scaling policy" is the correct answer.

INCORRECT: "Use a Simple scaling policy" is incorrect. Please refer to the description above.

INCORRECT: "Use a Dynamic scaling policy" is incorrect. Please refer to the description above.

INCORRECT: "Use a Step scaling policy" is incorrect. Please refer to the description above.

59. Question

An on-premise data center will be connected to an Amazon VPC by a hardware VPN that has public and VPN-only subnets. The security team has requested that traffic hitting public subnets on AWS that's destined to on-premise applications must be directed over the VPN to the corporate firewall.

How can this be achieved?

1: In the VPN-only subnet route table, add a route that directs all Internet traffic to the virtual private gateway

2: In the public subnet route table, add a route for your remote network and specify the customer gateway as the target

3: Configure a NAT Gateway and configure all traffic to be directed via the virtual private gateway

4: In the public subnet route table, add a route for your remote network and specify the virtual private gateway as the target

Answer: 4

Explanation:

Route tables determine where network traffic is directed. In your route table, you must add a route for your remote network and specify the virtual private gateway as the target. This enables traffic from your VPC that's destined for your remote network to route via the virtual private gateway and over one of the VPN tunnels. You can enable route propagation for your route table to automatically propagate your network routes to the table for you.

CORRECT: "In the public subnet route table, add a route for your remote network and specify the virtual private gateway as the target" is the correct answer.

INCORRECT: "In the VPN-only subnet route table, add a route that directs all Internet traffic to the virtual private gateway" is incorrect. You must create the route table rule in the route table attached to the public subnet, not the VPN-only subnet.

INCORRECT: "In the public subnet route table, add a route for your remote network and specify the customer gateway as the target" is incorrect. You must select the virtual private gateway (AWS side of the VPN) not the customer gateway (customer side of the VPN) in the target in the route table.

INCORRECT: "Configure a NAT Gateway and configure all traffic to be directed via the virtual private gateway" is incorrect. NAT Gateways are used to enable Internet access for EC2 instances in private subnets, they cannot be used to direct traffic to VPG.

60. Question

An Amazon DynamoDB table has a variable load, ranging from sustained heavy usage some days, to only having small spikes on others. The load is 80% read and 20% write. The provisioned throughput capacity has been configured to account for the heavy load to ensure throttling does not occur.

What would be the most efficient solution to optimize cost?

1: Create a CloudWatch alarm that triggers an AWS Lambda function that adjusts the provisioned throughput

2: Create a CloudWatch alarm that notifies you of increased/decreased load, and manually adjust the provisioned throughput

3: Use DynamoDB DAX to increase the performance of the database
4: Create a DynamoDB Auto Scaling scaling policy

Answer: 4

Explanation:

Amazon DynamoDB auto scaling uses the AWS Application Auto Scaling service to dynamically adjust provisioned throughput capacity on your behalf, in response to actual traffic patterns. This is the most efficient and cost-effective solution to optimizing for cost.

CORRECT: "Create a DynamoDB Auto Scaling scaling policy" is the correct answer.

INCORRECT: "Create a CloudWatch alarm that triggers an AWS Lambda function that adjusts the provisioned throughput" is incorrect. Using AWS Lambda to modify the provisioned throughput is possible but it would be more cost-effective to use DynamoDB Auto Scaling as there is no cost to using it.

INCORRECT: "Create a CloudWatch alarm that notifies you of increased/decreased load, and manually adjust the provisioned throughput" is incorrect. Manually adjusting the provisioned throughput is not efficient.

INCORRECT: "Use DynamoDB DAX to increase the performance of the database" is incorrect. DynamoDB DAX is an in-memory cache that increases the performance of DynamoDB. However, it costs money and there is no requirement to increase performance.

61. Question

A Solutions Architect has created a VPC and is in the process of formulating the subnet design. The VPC will be used to host a two-tier application that will include Internet facing web servers, and internal-only DB servers. Zonal redundancy is required.

How many subnets are required to support this requirement?

1: 2 subnets
2: 6 subnets
3: 1 subnet
4: 4 subnets

Answer: 4

Explanation:

Zonal redundancy indicates that the architecture should be split across multiple Availability Zones. Subnets are mapped 1:1 to AZs.

A public subnet should be used for the Internet-facing web servers and a separate private subnet should be used for the internal-only DB servers. Therefore, you need 4 subnets – 2 (for redundancy) per public/private subnet.

CORRECT: "4 subnets" is the correct answer.

INCORRECT: "2 subnets" is incorrect as explained above.
INCORRECT: "6 subnets" is incorrect as explained above.
INCORRECT: "2 subnet" is incorrect as explained above.

62. Question

The application development team in a company have developed a Java application and saved the source code in a .war file. They would like to run the application on AWS resources and are looking for a service that can handle the provisioning and management of the underlying resources it will run on.

Which AWS service should a Solutions Architect recommend the Developers use to upload the Java source code file?

1: AWS Elastic Beanstalk
2: AWS CodeDeploy
3: AWS CloudFormation
4: AWS OpsWorks

Answer: 1

Explanation:

AWS Elastic Beanstalk can be used to quickly deploy and manage applications in the AWS Cloud. Developers upload applications and Elastic Beanstalk handles the deployment details of capacity provisioning, load balancing, auto-scaling, and application health monitoring

Elastic Beanstalk supports applications developed in Go, Java, .NET, Node.js, PHP, Python, and Ruby, as well as different platform configurations for each language. To use Elastic Beanstalk, you create an application, upload an application version in the form of an application source bundle (for example, a Java .war file) to Elastic Beanstalk, and then provide some information about the application.

CORRECT: "AWS Elastic Beanstalk" is the correct answer.

INCORRECT: "AWS CodeDeploy" is incorrect. AWS CodeDeploy is a deployment service that automates application deployments to Amazon EC2 instances, on-premises instances, serverless Lambda functions, or Amazon ECS services.

INCORRECT: "AWS CloudFormation" is incorrect. AWS CloudFormation uses templates to deploy infrastructure as code. It is not a PaaS service like Elastic Beanstalk and is more focused on infrastructure than applications and management of applications.

INCORRECT: "AWS OpsWorks" is incorrect. AWS OpsWorks is a configuration management service that provides managed instances of Chef and Puppet.

63. Question

A Solutions Architect has created a new security group in an Amazon VPC. No rules have been created. Which of the statements below are correct regarding the default state of the security group? (Select TWO)

1: There is an outbound rule that allows all traffic to all IP addresses
2: There are no inbound rules and traffic will be implicitly denied
3: There is an inbound rule allowing traffic from the Internet to port 22 for management
4: There are is an inbound rule that allows traffic from the Internet Gateway
5: There is an outbound rule allowing traffic to the Internet Gateway

Answer: 1,2

Explanation:

Custom security groups do not have inbound allow rules (all inbound traffic is denied by default) whereas default security groups do have inbound allow rules (allowing traffic from within the group). All outbound traffic is allowed by default in both custom and default security groups.

Security groups act like a stateful firewall at the instance level. Specifically, security groups operate at the network interface level of an EC2 instance. You can only assign permit rules in a security group, you cannot assign deny rules and there is an implicit deny rule at the end of the security group. All rules are evaluated until a permit is encountered or continues until the implicit deny. You can create ingress and egress rules.

CORRECT: "There is an outbound rule that allows all traffic to all IP addresses" is the correct answer.

CORRECT: "There are no inbound rules and traffic will be implicitly denied" is the correct answer.

INCORRECT: "There is an inbound rule allowing traffic from the Internet to port 22 for management" is incorrect. This is not true.

INCORRECT: "There are is an inbound rule that allows traffic from the Internet Gateway" is incorrect. There are no inbound allow rules by default.

INCORRECT: "There is an outbound rule allowing traffic to the Internet Gateway" is incorrect. There is an outbound allow rule but it allows traffic to anywhere, it does not specify the internet gateway.

64. Question

A security officer has requested that all data associated with a specific customer is encrypted. The data resides on Elastic Block Store (EBS) volumes. Which of the following statements about using EBS encryption are correct? (Select TWO)

1: Not all EBS types support encryption
2: All attached EBS volumes must share the same encryption state
3: All instance types support encryption
4: Data in transit between an instance and an encrypted volume is also encrypted
5: There is no direct way to change the encryption state of a volume

Answer: 4,5

Explanation:

All EBS types and all instance *families* support encryption but not all instance *types* support encryption. There is no direct way to change the encryption state of a volume. Data in transit between an instance and an encrypted volume is also encrypted.

CORRECT: "Data in transit between an instance and an encrypted volume is also encrypted" is the correct answer.

CORRECT: "There is no direct way to change the encryption state of a volume" is the correct answer.

INCORRECT: "Not all EBS types support encryption" is incorrect as all EBS volume types support encryption.

INCORRECT: "All attached EBS volumes must share the same encryption state" is incorrect. You can have encrypted and non-encrypted EBS volumes on a single instance.

INCORRECT: "All instance types support encryption" is incorrect. All instance families support encryption, but not all instance types.

65. Question

An organization in the agriculture sector is deploying sensors and smart devices around factory plants and fields. The devices will collect information and send it to cloud applications running on AWS.

Which AWS service will securely connect the devices to the cloud applications?

1: AWS Glue

2: AWS IoT Core

3: AWS DMS

4: AWS Lambda

Answer: 2

Explanation:

AWS IoT Core is a managed cloud service that lets connected devices easily and securely interact with cloud applications and other devices. AWS IoT Core can support billions of devices and trillions of messages and can process and route those messages to AWS endpoints and to other devices reliably and securely.

CORRECT: "AWS IoT Core" is the correct answer.

INCORRECT: "AWS Glue" is incorrect. AWS Glue is a fully managed extract, transform, and load (ETL) service that makes it easy for customers to prepare and load their data for analytics.

INCORRECT: "AWS DMS" is incorrect. AWS Database Migration Service helps you migrate databases to AWS quickly and securely.

INCORRECT: "AWS Lambda" is incorrect. AWS Lambda lets you run code without provisioning or managing servers.

CONCLUSION

Congratulations on completing these exam-difficulty practice tests! We truly hope that these high-quality questions along with the supporting explanations helped to fully prepare you for the AWS Certified Solutions Architect Associate exam.

The SAA-C02 exam covers a broad set of technologies and it's vital to ensure you are armed with the knowledge to answer whatever questions come up in your certification exam. So, it's best to review these practice questions until you're confident in all areas. We recommend re-taking these practice tests until you consistently score 80% or higher - that's when you're ready to sit the exam and achieve a great score!

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The AWS platform is evolving quickly, and the exam tracks these changes with a typical lag of around 6 months. We are therefore reliant on student feedback to keep track of what is appearing in the exam. If there are any topics in your exam that weren't covered in our training resources, please provide us with feedback using this form https://digitalcloud.training/student-feedback/ . We appreciate any feedback that will help us further improve our AWS training resources.

To discuss any exam-specific questions you may have, please join the discussion on Slack . Visit https://digitalcloud.training/slack for instructions.

Also, remember to join our private Facebook group to ask questions and share knowledge and exam tips with the AWS community:
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AWS Certified Cloud Practitioner (offline) Practice Tests (ebook)	There are **6 practice exams with 65 questions each** covering the five domains of the AWS CLF-C01 exam blueprint. Each set of questions is repeated once without answers and explanations, and once with answers and explanations, so you get to choose from two methods of preparation: 1: To simulate the exam experience and assess your exam readiness, use the " **PRACTICE QUESTIONS ONLY** " sets. 2: To use the practice questions as a learning tool, use the " **PRACTICE QUESTIONS, ANSWERS &**

	EXPLANATIONS ” sets to view the answers and read the in-depth explanations as you move through the questions.
Training Notes for the AWS Certified Cloud Practitioner (cheat sheets)	This book is based on the CLF-C01 exam blueprint and provides a deep dive into the subject matter in a concise and easy-to-read format so you can fast-track your time to success. AWS Solutions Architect, Neal Davis, has consolidated the information you need to be successful.

Courses for the AWS Certified Solutions Architect Associate

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AWS Certified	There are **6 practice exams with 65 questions each** covering

SysOps Associate (offline) Practice Tests (ebook)	all topics for the AWS SOA-C01 exam. Each set of questions is repeated once without answers and explanations, and once with answers and explanations, so you get to choose from two methods of preparation: 1: To simulate the exam experience and assess your exam readiness, use the " **PRACTICE QUESTIONS ONLY** " sets. 2: To use the practice questions as a learning tool, use the " **PRACTICE QUESTIONS, ANSWERS & EXPLANATIONS** " sets to view the answers and read the in-depth explanations as you move through the questions.
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ABOUT THE AUTHOR

Neal Davis is the founder of Digital Cloud Training, AWS Cloud Solutions Architect and successful IT instructor. With more than 20 years of experience in the tech industry, Neal is a true expert in virtualization and cloud computing. His passion is to help others achieve career success by offering in-depth AWS certification training resources.

Neal started **Digital Cloud Training** to provide a variety of training resources for Amazon Web Services (AWS) certifications that represent a higher standard of quality than is otherwise available in the market.

Through our hands-on AWS training courses, we help students build the knowledge and practical skill set they need to not only pass their AWS certification exams with flying colours but to also excel in their cloud career.

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